

# CACTUS AND SUCCULENT JOURNAL

VOL. XXXI SEPT.-OCT., 1959 No. 5



FIG. 58. The last picture taken of Eric Walther.  
Don Skinner photo.



## CACTUS AND SUCCULENT JOURNAL

Published and owned by the Cactus and Succulent Society of America, Inc., 132 W. Union St., Pasadena, Calif. A magazine to promote the Society and devoted to Cacti and Succulents for the dissemination of knowledge and the recording of hitherto unpublished data in order that the culture and study of these particular plants may attain the popularity which is justly theirs. North and South America \$4.00 per year; foreign \$4.00 by money order. Mail application to SCOTT HASELTON, Editor, 132 West Union Street, Pasadena 1, California. Editorial Staff: THE ENTIRE SOCIETY. Entered as second Class Matter at Pasadena, Calif., under act of March 3, 1879. Published bi-monthly. We reserve the right to accept or reject advertising or articles sent to this JOURNAL.

VOL. XXXI

SEPTEMBER-OCTOBER, 1959 (Price 75¢)

No. 5

## CONTENTS

Eric Walther 1892-1959	130
Icones Plantarum Succulentarum, <i>Adromischus maximus</i>	P. C. Hutchison 131
Some Notes on "Cactus Chemurgy"	Robert R. Cruse 134
New Mexico Society	Harry Barwick 136
Icones Plantarum Succulentarum, <i>Disocactus quezaltecus</i>	Myron Kinnach 137
Cultivated and Native Agaves	August J. Breitung 142
Desert Flowers Under Glass	Marjorie E. Shields 146
Notes on Haworthias	J. R. Brown 150
Spotlight on Round Robins	Mrs. Gladys H. Panis 152
El Paso Rock Club	Mrs. James S. Brown 153
From Morristown, N. J.	H. S. Levenson 154
News from the I.S.I.	J. W. Dodson 154
<i>Deamia testudo</i> in Honduras	Clarence K. Horich 156
Cereusly Speaking	John E. C. Rodgers 157
Spine Chats	Ladislaus Cutak 159
St. Louis Convention Best Yet	Nick and Orva Bokarica 159
Oregon Cactus Society	Norman F. Minden 159

## ERIC WALTHER 1892-1959

The Plant World mourns the loss of a great friend, Eric Walther, who died of a heart attack on July 1, 1959 in San Francisco, California. He was the Director of The Strybing Arboretum and Botanical Garden in Golden Gate Park until his compulsory retirement in 1957. He then became a Research Associate of the California Academy of Sciences where one could find him five days a week working on his monograph of the genus *Echeveria*.

Eric was a self-educated immigrant from Dresden, Germany, arriving in this country in 1909. He worked at menial jobs until 1914-15 at which time he became interested in landscaping and moving trees for the Exposition in San Francisco; here he worked as a gardener until he was employed by Golden Gate Park in 1917. At this time Alice Eastwood was teaching a class in botany which was the beginning of his botanical knowledge. The next 40 years were devoted to building a botanical garden that attracted horticulturists from all over the

world and which he leaves as a living memorial.

In 1931 Eric became a very good friend of James West with a mutual interest in succulent plants. His first article in the Cactus and Succulent Journal (Vol. I, 1931) was on Aloes, then *Crassulas* of many kinds until in 1935 he started a series on *Echeveria* Hybrids. In 1935 he wrote a series "Collecting Succulents in Mexico" (Vol. VI, No. 9, pgs. 137-40) and from then on most of his work was on *Echeverias*. He has continued this specialized interest and after making many trips to the habitats in Mexico, Central and South America has prepared a monograph. We regret that Eric could not live to see his monograph in print but his great unselfish love for these plants and his confidence that someday it would be a reality may yet come true. Who knows?

We shall miss his personal enthusiasm, his cheerfulness, and his untiring courage.

## COVER PICTURE

The tall *Echeveria* being viewed by Eric Walther (see cover photo) was sent in from Mexico by T. MacDougall to Scott Haselton; the plant was later transferred to Don Skinner in Los Angeles. The collection number is MacDougall's B-85. This unnamed species grows at the top of Cerro Yacumino, which is the high peak (over 10,000 ft.) to the south of Tlaxiaco, Oax. In the next Journal we will show one of Mr. MacDougall's habitat photos.

## TWO RECOMMENDED CACTI

Robert S. Woods of Covina, California, sent us two Kodachromes with this notation: "Notocactus haselbergii, two inches in diameter and two and a half inches high, produced three flowers last March and remained open continuously and in good condition for fifteen days—including some very hot weather. Isn't this something of a record for duration of cactus flowers? The other slide of *Gymnocalycium friedrichii* is one of the best blooming cacti I have ever had."

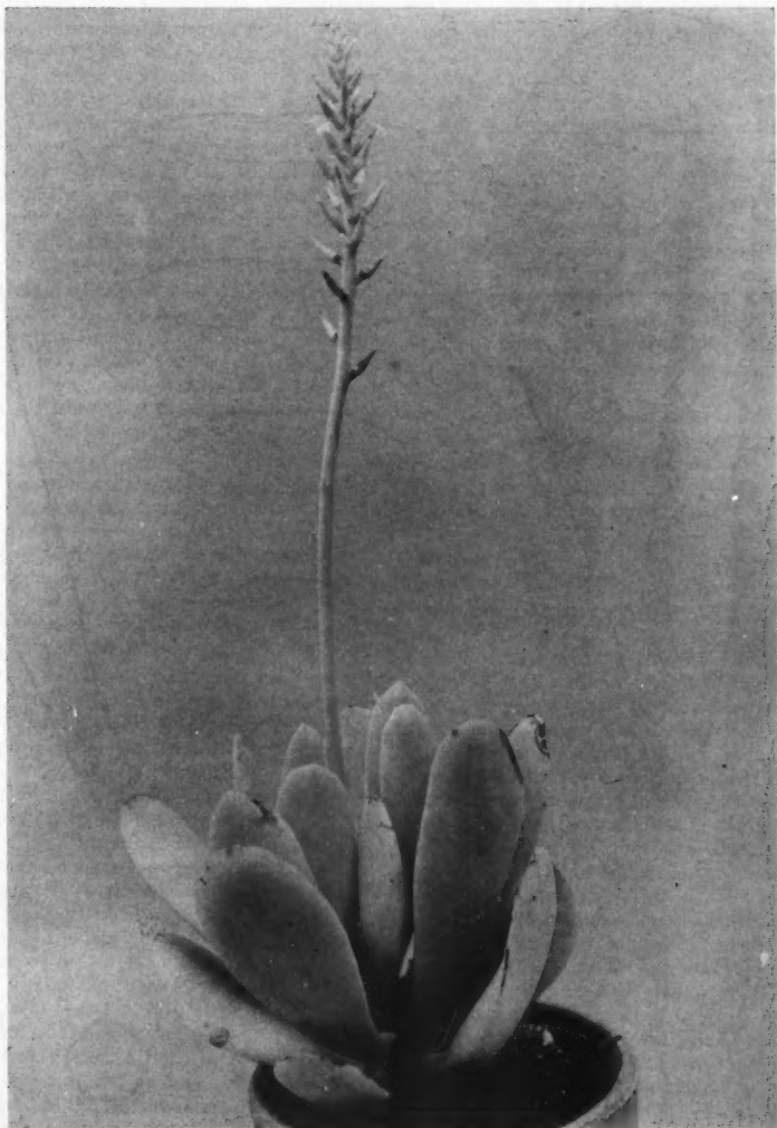


FIG. 59  
*Adromischus maximus* Hutchis., the clonotype, ca.  $\frac{1}{2}$  nat. size.

## *Icones Plantarum Succulentarum*

### 16. *Adromischus maximus* P. C. Hutchison\*

By P. C. HUTCHISON

Specialists contend that they can always distinguish a living species of *Astroloba* from a *Ha-worthia* without flowers, and, in fact, although

these genera are so closely related that separation seems of dubious value, determinations to genus based on vegetative characters are usually correct.

\*University of California Botanical Garden Contribution Number 156.

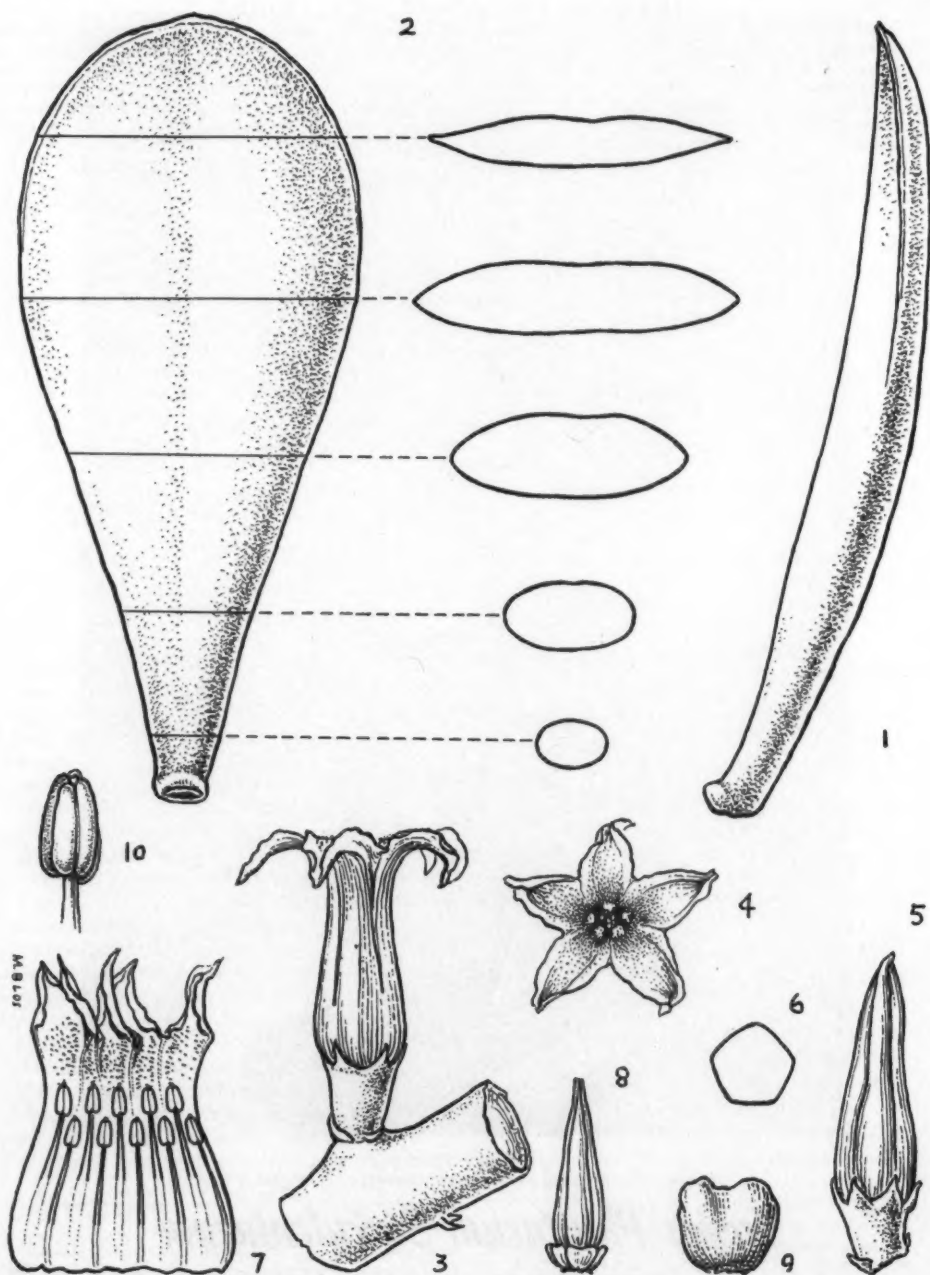


FIG. 60

*Adromischus maximus* Hutchis., the clonotype, U.C.B.G. 53.1106-1. 1. Leaf, side view. 2. Leaf, top view and cross-sections. 3. Flower. 4. Perianth-limb, expanded. 5. Bud. 6. Cross-section perianth-tube at midpoint. 7. Stamen insertion. 8. Carpels. 9. Nectary-scale. 10. Anther. 1, 2, natural size. 3-8, x 3. 9, 10, greatly enlarged. Drawing by Mrs. M. Blos, 1957.



Likewise, *Adromischus* is usually separable from the closely allied genus *Cotyledon* on vegetative features alone. As is so often the case it is far easier to make the determination to genus than it is to state what mental processes, or what physical features of the specimen, lead the taxonomist to his conclusion. I had special occasion to think on these matters when the first, sterile, living material of the new species described below arrived in Berkeley, for it seemed certain to me, at that time, that the collector had erred in referring it to *Adromischus*, and that the plant was actually a *Cotyledon*. When it flowered, however, Mr. Harry Hall, the collector, was confirmed in his opinion that he had again found an *Adromischus*, and a new species as well. It is notable for producing the largest leaves so far recorded in this genus.

*Adromischus maximus* P. C. Hutchison, sp. nov. Folia oblongo-spathulata, usque ad 12.5 cm. longa, 5.5 cm. lata, 1.5 cm. crassa, flavido-viridia, non maculata; pedunculus 35 cm. longus, 7-8 mm. basi diam., maximum partem ca. 5 mm. diam.; flores ca. 60, 1-3-ni, conferti; pedunculi, pedicelli, calyces et tubus perianthii flavido-virides; petala alba pallide roseo-tincta, apicibus sursum vel deorsum curvatis vel lateraliter tortis.

Roots fibrous. Stems erect, 6 cm. long or more, up to 2.5 cm. in diameter, brown, becoming scaly gray with age. Leaves alternate, erect to spreading, oblong-spathulate, up to 12.5 cm. long and 5.5 cm. wide, thickest below the middle, up to 1.5 cm. thick, usually slightly convex above and below but sometimes flat near the apex, pale yellowish green, unspotted, the margins concolorous, somewhat acute in the upper third, the cross-sections at all points symmetrical. Inflorescence simple; peduncle ca. 35 cm. long, 7 to 8 mm. in diameter at the base, at least 5 mm. in diameter for most of its length; rachis ca. 15 cm. long, viscid; flowers 60 or more, suberect, 1 to 3 together, very crowded. Pedicels 2 to 3 mm. long and thick. Calyx-lobes deltoid, acute, sometimes faintly rose-tipped, 1 mm. long and wide. Peduncle, pedicels, calyx and perianth-tube the same color as the leaves. Perianth-tube 10 to 11 mm. long, 4 mm. in diameter at the base, narrowed to 2.5 mm. just below the apex, the cross-section at mid-point pentagonal, the sinuses extending down the tube to just below the middle, the limb-lobes free, spreading, 2.5 mm. wide, 4 mm. long, triangular, white, tinged with pale rose apically, darker on the outer face, the apices curved up or down or twisted laterally, the tube-throat papillose, the papillae green, extending to the base of the lobes and sometimes further, these whitish. Stamen-filaments biseriate, ca. 4 mm. long, the insertion of the lower series 2 to

3 mm. from the base, of the upper series, 2 to 3 mm. higher; anthers included, yellow-green, the terminal globule not stalked, obscure, sometimes absent. Carpels 8 to 9 mm. long. Nectary-scales 1+ mm. long and wide, retuse, pale yellowish.

South Africa, Van Rhynsdorp District near top of the Giftberg amongst rocks in full sun, leg. H. Hall, University of California Botanical Garden 53.1106-1 (BOL-Holotype). The species is known only from the type locality.

Material of the type collection was first received from Stellenbosch Botanical Garden in November, 1953, then from Mr. Hall, the collector, in April, 1954, and in May of the same year two additional plants arrived from Stellenbosch. Living material is cultivated at Stellenbosch under the number 22061, and at the National Botanic Garden, Kirstenbosch, under the number 475/53. Two plants have survived here and the description and type specimen are prepared from one of these.

Hall states that the plants become one foot tall (without flowers) and up to 1½ feet wide, and that the leaves persist for many years.

*Adromischus maximus* belongs in the assemblage of species related to *A. maculatus* (Salm Dyck) Lem.—section *Incisilobatae* Uitewaal. It differs from all species of this genus by its large, erect, pale yellow-green leaves, and, at its fullest development, in an almost thyrselike inflorescence with an exceedingly thick peduncle and densely crowded flowers. Among the related species none have a flower so markedly constricted near the apex of the perianth-tube. In aspect, the plant resembles *Cotyledon orbiculata* L. so closely that it was not until it flowered that its generic identity was established.

An unusual feature of this new species is the long persistence, in cultivation, of the inflorescence. After reaching maximum height the peduncle ceased growing, but continued to produce flowers from between the first crop, for another four months. A long-delayed group of buds at the apex of the peduncle opened a full 8 months after the opening of the first flower of the inflorescence and the peduncle remained alive (green) for another two months, before it began to dry up.

The species is slow-growing and of no particular ornamental value, but will doubtless give pleasure to the succulent collector because it differs in so many ways from other species of *Adromischus*. It has survived several mild winters outside here in Berkeley, and grows more quickly under these conditions than when grown under glass in a pot. However it probably would be susceptible to damage by frost.

## *Some Notes on "Cactus Chemurgy"*

By ROBERT R. CRUSE\*

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Recently in this Journal (1), Mrs. Joseph G. Kres gave an excellent summary of a literature survey made by the author on the current and potential commercial uses of xerophytic plants (2). This discussion will elaborate on certain phases of this field, particularly with regards to the economic aspects involved.

This survey, a previous survey by the author (3), and a number of similar surveys by Duisberg (4, 5) have indicated that there is a definite positive potential with respect to the industrial utilization of cacti and succulents. The author's own interest stems from a personal desire to see established a chemical or allied industry, based on replenishable sources of raw materials, in a desirable climate. Most chemical industry, research or production, is not so oriented in either of these aspects. As a further *raison d'être* for such an operation, consider the agricultural situation as it now exists in the U.S. Much publicity, most of it unfavorable, has been given the current operation of the price support program; also, the soil bank. Officials of the former have openly admitted that the entire program is based on many faulty premises, which may have been true some years ago, but are not at present. In even considering *any* program on the use of agricultural crops as sources of raw materials, it is the author's firm opinion that the crops chosen must compete, when fully developed, in the open market, without government props. Cacti and other xerophytic vegetation offer several advantages in this respect: they will grow under adverse climatic conditions, with a minimum of attendant labor, and on marginal land. In the U. S. A. and Mexico, insect pests for and diseases of cacti and succulents are considerably less numerous than those for say, wheat, corn, or cotton. Some cactus species are susceptible to disease; e.g., the *sahuaro*; these are usually, however, the less common, or less promising species so far as chemurgy is concerned. Further, there is the aspect that, under certain conditions, and in certain areas, the cacti are considered as weed pests. Biological control of the prickly pear has been used in Australia (6); other methods have been used in Texas (7) and South Africa (8)—the growth of various *opuntias* in Australia and South Africa is truly awesome even to a cactophile; many stands of the plants are com-

pletely impassable to men or animals. In the U. S., federal subsidies have been offered for cactus eradication in the Texas and Oklahoma panhandles and in southwestern Kansas.

As an antithesis to the above, there is the situation growing out of the drouth in south Texas from roughly 1949 to 1956. Several manufacturers offer specially designed blow-torches to burn the thorns off cacti, notably prickly pear, so that the leaves can be utilized as feed for cattle. Ranchers in the area freely utilized existing stands of cacti as cattle feed, and by so doing, saved their herds from starvation or forced sale at disaster prices. A press release during 1958 carried the statement from one south Texas rancher to the effect that his herd had literally been saved by the feeding of cacti, and that if he were to be offered a very substantial amount of money for the cacti on his range, he would refuse it quickly. His scorn of federal eradication subsidies was most emphatic.

In considering a plant species for chemurgic utilization, it is assumed, of course, that extractives of value are present; also, that these extractives, individually or collectively, are of sufficient value to warrant the capital investment involved. The U. S. Department of Agriculture has stated (9) that various agaves containing appreciable quantities of steroids which are cortisone precursors are, in connection with the long fibers present, an economically feasible crop. The fibers alone are apparently an economic crop in Europe (10) as well as in parts of North America. Agave fibers are used extensively in brushes (Fuller Brush Co. utilizes much agave fiber in their products) as well as in paper, filters, gas masks, straw hats, and other applications. In preparing these fibers for market (in itself a major problem on which more research could be utilized), the decorticated pulp, containing the steroids, is currently discarded. In view of the fact that the steroids present are worth about \$10 per lb (estimated, 11) the utilization of the steroid-containing pulp should be quite important in operations involving agaves.

The prickly pear, likewise, offers several concurrent possibilities. Some of these need more fundamental study, however. The published chemical and medical literature distinctly indicates the presence of a factor, as yet uncharacterized, therapeutically beneficial against diabetes in a positive way, i. e., the disease is

\*The author is Associate Industrial Chemist (Organic), Department of Chemical Research.

cured or arrested (12-18). Unofficial reports given the author privately confirm these published reports and indicate that the use of an extract of prickly pear leaves has been recorded as far back as 1883 for the purpose of diabetic therapy. The U. S. Food and Drug Administration, and the American Medical Association must both be unequivocally convinced, however, not only with respect to the efficacy of the extract, but also with respect to the toxicity, in either dilute or concentrated form. An extensive research program is necessary to fulfill the above requirements.

Another economic factor to be considered is the particular nature of the extractive. Certain extractives appear to be formed as a result of a drouth-resisting mechanism; the steroids, especially, seem to be in this category. Therefore, if attempts are made to hasten growth by heavy irrigation, the yield of steroids or other desirable extractives may be reduced. One way that has been proposed to counteract this problem is to irrigate heavily for one year and to allow any natural rainfall or moisture to prevail the second year. In this way, growth would be effected first; the desired extractive would then be developed.

At this point it should be brought out that the wild plants, despite their abundance in certain areas, do not offer a sufficiently safe source of raw material supply. Even our pine forests require conservation and reforestation despite their size. Demand for, say, prickly pear, in the case of the development of a desirable pharmaceutical extractive, or series of various extractives, would rapidly exceed the supply of wild plants. Therefore, establishment of a controlled source of the plants would be mandatory for a long-range test of the raw materials.

Establishment of a plantation, to carry the discussion further, will be more economically feasible if all extractives of value are utilized. The meat packing industry utilizes "everything but the squeal" in pork and beef processing; the Hawaiian pineapple industry, to quote the guides at the Dole factory in Honolulu, uses "everything but the wiggle." Major and minor products and by-products are numerous in both industries; disposed waste from actual factory operations is at a minimum. A similar consideration should be given to the recovery operations of extractives in cacti and succulents; everything of value should be recovered. Again, such knowledge will be attained only through a considerable additional research effort.

Genetic studies might prove advantageous. This is indicated as a result of the work during and following World War II on guayule. The wild xerophytic shrub contained some 20%

rubber (cis-isoprene polymer) in the cells, and matured in about five to seven years. As a result of hybridization studies, the cross-bred shrub matured in three years and contained about 40% rubber in the cells. In this connection, it is both of interest and importance to note that synthetic rubber alone was and has been necessary in every tire manufactured that met federal specifications. Guayule rubber, although not quite the equivalent of hevea latex (93% cis-isoprene polymer in the latter, vs 80% in Guayule), should offer an adequate stop-gap source of rubber in case of emergency. By the same token, hybridization might increase the concentration of the antidiabetic factor in the prickly pear, or the steroid content of the various agaves.

Having thus established the purely agricultural aspects of the field, we must next consider the more prosaic, but nonetheless important items of labor and utilities. In Mexico and Latin America, the labor supply, with respect to agricultural workers, is generally considered to be adequate. In the U. S., the labor situation would dictate a maximum of mechanization. Although water for irrigation may not be essential, depending on the nature of the project, some water for processing and domestic purposes would be essential. Process heat would also surely be essential; this factor may, to some extent, dictate a location near a gas or oil pipe line, a coal field, or other source of energy. Nuclear power could doubtless be used, or with sufficient development, solar energy. Electricity could be supplied by generation from the process heat if no other power source were available.

The use of solar energy is by no means a remote possibility. A report emanating in 1946 (19) stated that the Russians were utilizing a helio-boiler to provide heat and power to a fruit cannery in southern Siberia, near the Indian border. The sunshine was said to average 280 days per year in that area, a figure equalled or surpassed by the American Southwest, wherein the cacti flourish most prolifically. The Association for Applied Solar Energy in Phoenix, Arizona, reports vast strides in the past ten years in the field of solar energy utilization. When it is considered that the solar energy reaching an area 50 miles square on a sunny spring day is about equivalent to the energy output of all the power plants operating on coal, gas, or oil fuels (exclusive of nuclear or hydroelectric power) in the U. S. for an equivalent time, the resource of solar energy looms very large indeed, potentially. The actual figure for solar energy radiation reaching the earth under the above conditions is 430/BTU/hr.

One further argument for a plantation in-

volves the legal aspects. These could be a major problem if the wild plants alone were utilized. On private property, the ranch or farm owners would have to be amenable (and, as has been mentioned, some of them in South Texas, at least, won't be). On public lands, various problems arise, both with respect to state and federal regulations. Arizona, in particular, has rather severe laws protecting cacti and natural succulents, and the U. S. Forest Service has mixed emotions, depending upon the location.

The author hopes that this article, along with Mrs. Kres's abstract, will present a story of interest to all cactophiles, and that the problems involved may be approached honestly and realistically, with the objective of breaking into a new field of endeavor. It is of interest to note that scientists of the U. S. S. R. and the People's Republic of China are working with steroids from yuccas (20-23) (yes, they have arid areas there, too, along with some of the same species of yuccas and agaves. Thus, worldwide) application is feasible, and with it perhaps a new potential for peace, in the assistance of the conquest of disease and hunger.

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#### FROM ILLINOIS

In answer to the two questions in the Journal Vol. XXX No. 5 Page 155 I'm sending you this reply:

- Which cactus and succulents flower the most? I have the best luck in flowering *Gymnocalycium* species, almost all *Echinopsis*'s, and the old favorite of many, *Hamatocactus setispinus*.
- Which cactus and succulent is the biggest waste of time? The plants I think are the biggest waste of time are the so-called "Orchid Cactus" they take up a large spot when mature, they are hard to please climate wise, they do not look "good" except when in bloom (if you can get them to bloom!) and the biggest fault—THEY DON'T LOOK LIKE A CACTUS!

This last question will draw a lot of "sharp" talk and thoughts from fanciers of these—strange—plants but these are my own ideas from the growth of them in my collection (they are no longer with me).

JIM RUGH

#### NEW MEXICO SOCIETY

On my two week vacation, in the early part of July, I spent five days in Albuquerque, New Mexico. In my short stay I was able to meet some of the members of the Cactus and Succulent Society of New Mexico. I want to say that these people treated me with the plush carpet. All of them had wonderful collections, had a lot of cactus knowledge, the welcome extended by these people gave me a pleasant feeling, and they were generous with information and gifts. Their outdoor cactus gardens made up of native plants are to be envied, and besides they have their rare plants either under glass or lath. In between family demands and trips, I was able to spend a couple of hours with the following cactus friends: Ed Nadolny, Prince Pierce, Fanny Furrer, Lillian Drake, and Dr. Edw. Castetter. My regret is that I could not see more of the members of this lively cactus club.

On my way to Albuquerque, I stopped at Jennings, Mo., a suburb of St. Louis, to see Mrs. Ann O'Connell, who has a large and interesting collection under glass. Also stopped at Eureka Springs, Arkansas, to see Mrs. Eid h Bestard; her collection was out of the greenhouse and although not large had some beautiful specimens of *Mammillarias*. I enjoyed meeting both these ladies.

Hope that you will print this letter in the *Cactus Journal* so that the other journeying cactus minded will visit these people and glean the knowledge I have.

HARRY BARWICK



## Icones Plantarum Succulentarum

### 17. *Disocactus quezaltecus* (Standley et Steyermark) Kimnach (1)

By MYRON KIMNACH

In 1941 Paul C. Standley discovered *Bonifazia quezalteca* Standl. & Steyermark, growing on tree-trunks in dense, damp forest in Guatemala. In publishing it as a new species, Standley and Steyermark (2) commented: "This is one of the most beautiful and ornamental of the epiphytic cacti of Central America. While of course the flowers are not so large as in some species of *Epiphyllum* or of the *Cereus* group, they are borne in great abundance and are of exceptionally beautiful color and form. They are of a delicate, rather pale reddish purple. The plants hang loosely against the tree trunk, the flowers being abruptly recurved from the base so that their apices point upward." These authors named the species for its occurrence in Quezaltenango, Guatemala, and placed it in a new genus, *Bonifazia*. No plants were then or later brought into cultivation and no illustration of the flowers has been published.

The type locality is above Mujuliá, between San Martín Chile Verde and Colomba, western Guatemala, not far from the Mexican border. In March 1957 Clarence Horich visited this area to obtain the species for the University of California Botanical Garden. In an account (3) of his collecting there he mentions that "San Martín Chile Verde" is a popular but unofficial name for San Martín Sacatepéquez. The species does not grow at Mujuliá, which is low and tropical, and the first plants encountered by Horich were at 1650 m. in the cloud forests of Chuikabál, the coldest, wettest part of that region. The plants were in flower and grew in dense clusters on the trunks and branches of the highest trees, nearly hidden by the constantly misty darkness of the jungle and the profusion of other epiphytes. He also mentions (*in litt.*) that he found the species growing epiphytically in similar cloud-forested areas between San Martín Chiquito and Las Nubes, south to El Pozo (Gerona) and Chuikabál. These localities are all at altitudes between 1800 and 2100 meters in the valley of Río Naranjo, Canton Tuhilacán, Dept. Quezaltenango. Cloud-drifts prevail all year, but in the dry season, which ends in May, the fog is present only in the afternoon. Among the associated epiphytes were aroids, orchids, begonias, bromeliads and ferns; between Km. 12 and Km. 16 of the road from San Martín Sacatepéquez to Colomba they included an *Echeveria* and a *Helicocereus*, both now growing at the Botanical Garden.

Some eighteen plants of *Bonifazia quezalteca*, collected by Horich at indefinite localities between Las Nubes and Mujuliá, have flowered and fruited in Berkeley, and it is now possible to furnish a drawing and a more complete description of this species, as well as to clarify its relationship and to evaluate the genus *Bonifazia*. For reasons discussed below I do not recognize this genus and am transferring its single species to *Disocactus* Lindl. The following description is based primarily on the Horich collections, which showed no significant variation, and partially on the holotype from Field Museum; these are the only known collections.

*Disocactus quezaltecus* (Standl. & Steyermark) Kimn., *comb. nov.*

*Bonifazia quezalteca* Standl. & Steyermark, Field Mus. Nat. Hist.—Bot. 23: 66, 1944.

Primary stems with terete bases up to 35 cm. long and 5 to 8 mm. wide, reddish when young, later green, with 3 rows of areoles each containing up to 15 whitish bristles up to 15 mm. long, flattened apically for 10 to 45 cm.; secondary stems branching mostly from the apical half of the terete primary bases, in 2 or 3 ranks, the bases terete and ca. 1 cm. long and 3 mm. wide, flattened apically for 10 to 35 cm.; flattened portions of all stems linear-lanceolate, subacute or often obtuse, reddish when young, later green, 1.5 to 6 cm. wide, obtusely serrate or often crenate near the base, the lobes projecting ca. 3 mm., nearly all the areoles with 1 to 3 recurving, brownish or whitish bristles up to 4 mm. long, the areoles after the first flowering becoming exerted and branched, with minute bracteoles, wool and often with 1 or 2 yellowish spines up to 1 mm. long.

Flowers at or near the stem-apices, single, tubular but with the apical half widened, 8.5 to 9 cm. long, the tepals erect, the perianth 9 to 11 mm. wide at the middle, light purplish, the limb 3 to 5 mm. wide, the receptacle reddish purple, nearly straight on erect stems, strongly upcurved near the base on pendent stems; *pericarpel* inconspicuous, ca. 5 mm. long; entire *receptacle* ca. 5 cm. long, the basal half 4 to 5 mm. wide, the apical half 6 to 8 mm. wide, the upper surface of the basal half purplish red (Mallow Purple 630) (4), slightly pruinose, the lower surface nearly white, the apical half pale pink (Mallow Purple 630/1), the podaria ca. 7, restricted to

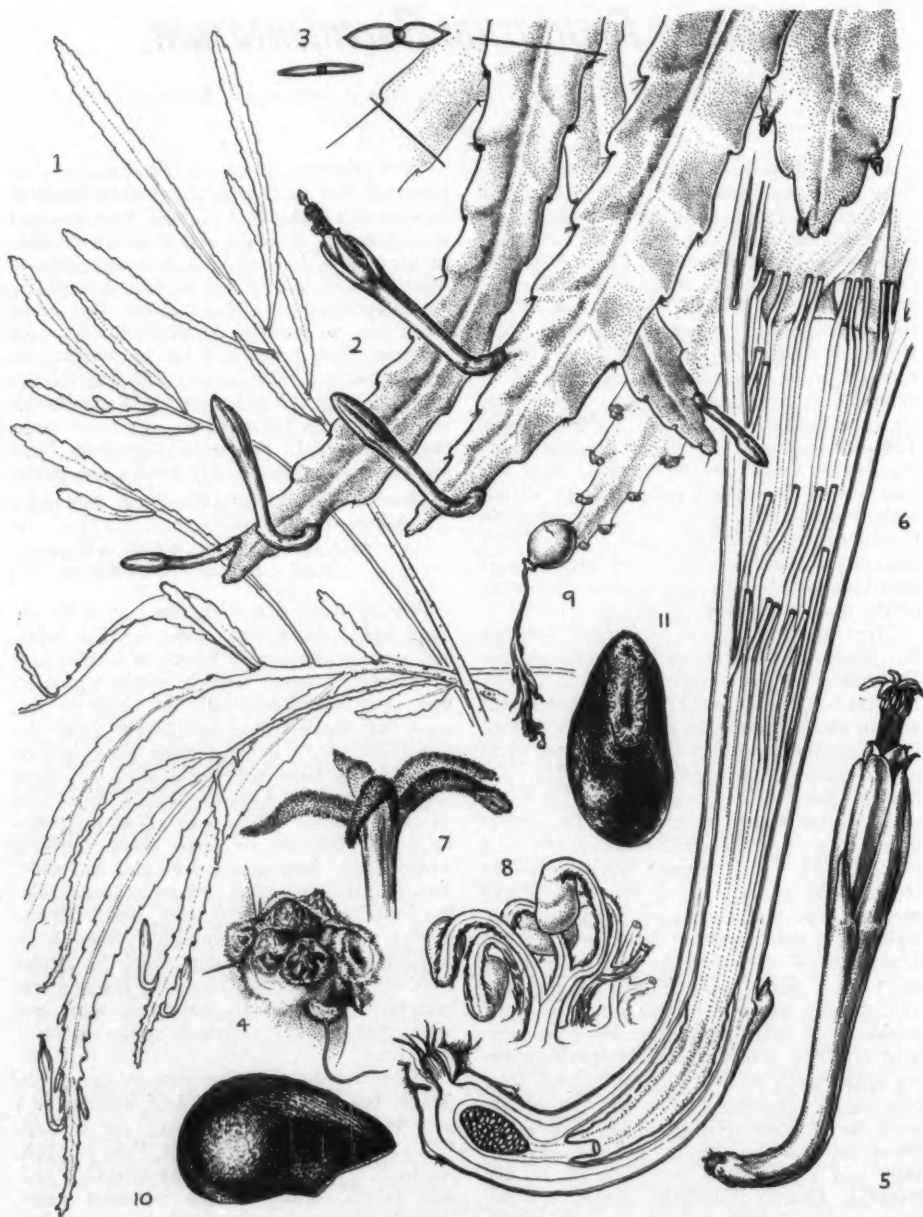


FIG. 61

*Disocactus quezaltecus* (Standl. & Steyerl.) Kimm., U.C.B.G. 57.235. 1. Stems and flowers, x 0.16. 2. Stems and flowers, x 0.5. 3. Cross-sections of a young stem (at left) and an old stem (at right), x 0.5. 4. Proliferous areole, x 5. 5. Flower, x 1. 6. Receptacle cross-section, x 3. 7. Stigma, x 4. 8. Funicles and ovules, greatly enlarged. 9. Fruit, x 0.5. 10, 11. Seed, x 20. Drawing by Mrs. M. Bloss, 1959.

the lower  $\frac{1}{3}$  of the receptacle, inconspicuous, up to 1 mm. high and wide, obtuse, the upper ones often somewhat emarginate near the bracteole, the bracteoles appressed, deltoid, acute or subobtusate, up to 1 mm. wide, pinkish white, the lower ones subtending sparse, minute, slightly protruding yellowish hairs less than 0.5 mm. long, the upper  $\frac{2}{3}$  of the receptacle with obtuse, decurrent tepal-bases up to 3 cm. long and ca. 4 mm. wide; *outer tepals* 5, erect and appressed to the inner ones, lanceolate, subobtusate to obtuse, 16 to 23 mm. long, ca. 4 to 6 mm. wide, the inner face concave and pinkish white, the outermost 3 pink on the outer face and white only at the margin, the inner 2 wider, pink along the center, otherwise white, the *inner tepals* 5 or 6, partially visible between the outer ones and prolonged ca. 2 mm. beyond them, incurved and appressed to the stamens, the apices slightly expanding, ovate-lanceolate, obtuse, ca. 2 cm. long, 6 to 8 mm. wide, concave on the inner face, both faces pinkish white (Mallow Purple 630/3), darkest along the center and at the apex; *ovule-chamber* ellipsoid, 4 mm. long, 1.5 mm. wide, the funicles single or fascicled, fimbriate along the inner side of the curve, the *nectaries* 8 to 10 mm. long, hardly protuberant, pinkish white, the area between the nectaries and the lowest whorl of stamens 1.5 cm. long, pinkish white; *stamens* 41 to 47, exerted ca. 1 cm., inserted in two zones, the lower 1 to 1.5 cm. long with filaments 4 to 4.5 cm. long, the upper a throat-circle with filaments ca. 2.5 cm. long, all filaments pinkish, the anthers 1 to 1.5 mm. long, ca. 0.75 mm. wide, dark pink before dehiscence or rarely yellowish; *style* 7 to 8 cm. long, ca. 0.5 mm. thick, pink, the lobes 5 or 6, irregularly recurved, subulate, 3 to 4 mm. long, papillose on the inner face and margins, pinkish cream.

*Fruit* ovoid, with a neck-like extension, ca. 18 mm. long and 10 to 15 mm. wide, the epidermis smooth, shiny but somewhat pruinose, purplish red, translucent and with visible white venation, the podaria obscure, flattened, the bracteoles up to 1 mm. long, widely deltoid, appressed, subtending yellowish hairs less than 0.5 mm. long, the fruit apex usually prolonged into a neck-like, often umbilicate extension up to 2 mm. long and ca. 4 mm. wide, the pendent, persistent floral remains 4 to 5

cm. long; pulp odorless, tasteless, pink, evenly filled with seeds; fruit finally drying, persistent, indehiscent.

*Seeds* ovate-reniform, 1.5 to 2 mm. long, 1 to 1.25 mm. wide, 0.75 to 1 mm. thick, the testa shiny, minutely verrucose-pitted, brownish black, the hilum oblique or rarely subtruncate, curved or straight, not depressed.

Chromosome number:  $2n=22$  (5).

Guatemala: Dept. Quezaltenango: above Mujuliá, between San Martín Chile Verde and Colomba, 1800 m., in dense, damp, mixed forest on white sand slopes, Feb. 1, 1941, Standley 85603 (F, holotype); between Las Nubes and Mujuliá, in dense cloud forest, 1800-2100 m., March 13, 1957, Horich s.n., University of California Botanical Garden 57.235 (F, UC, US).

The stems of *D. quezaltecus* are conspicuously reddened when immature but later turn green. As in *D. eichlamii* (Weing.) Britt. & Rose and *D. macranthus* (Alex.) Kimn. & Hutchis., the floriferous areoles become exerted after the first flowering and thus resemble pedicels; as in those species they also bear minute scales and hairs and later form branched clusters (see 4 of Fig. 61), but, unlike those species, only a single flower of *D. quezaltecus* has been observed at an areole at one time, though probably they will cluster during next year's flowering. Our specimens flower from March through June. Anthesis begins with the exertion of the stigma during mid-afternoon and of the stamens about an hour later; the tepals hardly expand, except for an occasional spreading of the apices, and remain appressed to the stamens. Each flower lasts four days before withering. Unlike *D. eichlamii*, this species does not form fruit readily unless hand-pollinated with its own pollen or with that of an ally. Emasculated flowers have set fruit when fertilized by pollen of *D. eichlamii* and *D. nelsonii* (Britt. & Rose) Lindinger. The fruits are greenish for  $2\frac{1}{2}$  months, then quickly become bright red and translucent. Germination of seeds in the fruit, as in *D. eichlamii*, has not been observed.

*D. quezaltecus* is closest allied to the other Guatemalan species with unexpanded tepals, *D. eichlamii*, which was figured and discussed (6) earlier in this series. Their main differences are as follows:

	<i>D. quezaltecus</i>	<i>D. eichlamii</i>
flower length	8.5 to 9 cm.	6 to 7 cm.
flower color	pericarpel brownish purple, the tube and tepals whitish purple	pericarpel greenish, the tube and tepals purplish scarlet
tepal length	ca. $\frac{1}{2}$ the floral length	at least half the floral length
number of stamens	41 to 47	13 to 20
anthers	purplish red	cream

These species have rarely been collected, but they apparently occupy small, approximate, yet separate, areas. Intraspecific variation has not been detected and intergrading forms are not known to occur between these areas. Although the few specimens at hand do not show these species to be separated by major differences, *D. quezaltecus* seems well-deserving of recognition.

Standley and Steyermark did not compare *D. eichlamii* with their new species because they were unaware of their close floral resemblance. They had not collected *D. eichlamii* in Guatemala and knew it only from its treatment by Britton and Rose, who, in the generic key (7) to their subtribe *Epiphyllanae*, included it under genera with "spreading or reflexed" tepals; as this species actually has tepals which are always erect, Britton and Rose described its flowers inaccurately. In consequence Standley and Steyermark stated that the relationship of *D. quezaltecus* "is clearly with the monotypic genus *Chiapasia*, which also occurs in Guatemala. It has in common with that a distinctive habit, and particularly the narrow perianth, abruptly recurved from the base . . . The Guatemalan plant can not be referred satisfactorily to *Chiapasia*, because in that the segments of the perianth are two to three times as long as the tube, very narrow and long-attenuate, and the stamens are about half as numerous."

Steyermark had collected *Disocactus* (*Chiapasia*) *nelsonii* in Guatemala, but he and Standley apparently knew its floral characters mainly from the brief and partially erroneous description by Britton and Rose (8). The latter authors gave the number of stamens as 20, but in my discussion (9) of this species I pointed out that they really numbered 55 to 65 and are thus actually more numerous than in *D. quezaltecus*, in which they number 41 to 47. Britton and Rose also state that the perianth segments of *D. nelsonii* are narrow, yet they are more than twice as wide as those of *D. quezaltecus*. Standley and Steyermark therefore did not accurately differentiate these two species.

It was not mentioned in the original description that the tepals of *D. quezaltecus* never expanded, and this has been partly responsible for the delay in determining the affinities of this species. Its authors did mention that at first they considered placing it in *Wittia* Schum., which also has erect tepals shorter than the receptacle, and on the holotype sheet is a manuscript name under this genus. Marshall (10) did not see the holotype, but assumed the tepals were erect and believed the species could be included in *Wittia*. The one discrepancy of which he was aware, the upcurved receptacle, he thought was caused by the flowers emerging from pendent stems, and he presumed that if

the stems were trained erect the flowers would be straight. This is correct, for on our plants the buds on erect stems remain straight, whereas on pendent stems they are at first straight and point downward but eventually upcurve abruptly near the base; this behavior is also typical of *D. nelsonii*, *D. biformis* (Lindl.) Lindl. and *D. macranthus*. However, in the closely allied genus *Wittia* the flowers are straight regardless of stem-position and in addition the stamens and stigma are nearly or completely included, whereas these are far-exserted in *Disocactus*. *D. quezaltecus* thus seems closer allied to *D. eichlamii* than to *Wittia*.

In their generic key (7), Britton and Rose included *Disocactus* under genera with "the tube of flower not longer than limb," whereas in *D. quezaltecus* the tube is longer than the limb. In consequence of this and their misunderstanding of *D. eichlamii*, Standley and Steyermark believed their species to constitute "a very distinct unit, that can not be placed satisfactorily in any of the groups segregated by Britton and Rose, and has much better claims to generic rank than most of those." They therefore placed it in a new, monotypic genus, *Bonifazia*, named after a Guatemalan family who had hosted Standley on his visit to that country. An earlier generic name of similar spelling is "*Bonifacia*" Manso ex Steud. (*Rubiaceae*), which apparently was never validly published; according to the Index Kewensis it was published by Steudel in 1840, but the latter gives no description in the work cited, merely listing the genus as a synonym and Manso as the author.

Although *Bonifazia* is therefore legitimate, I do not consider it a genus that serves any useful function. A comparison of the drawings and descriptions of *D. quezaltecus* and *D. eichlamii* (6) clearly shows the close resemblance of these species. The shorter tepals and longer tube of *D. quezaltecus* are characters which are adequate for separating it as a species but not as a genus. The situation is nearly paralleled within the family in the long-tubed, short-tepaled *Epiphyllum phyllanthus*, which has never been made a monotypic genus even though the other *Epiphyllum* species possess tepals much longer in proportion to the tubelength. The fact that *D. quezaltecus* does not fit within Britton and Rose's generic key also fails to justify the erection of another genus and to me further signifies that their definition of *Disocactus* should be widened to accommodate this species.

#### REFERENCES

1. University of California Botanical Garden, Berkeley, Contribution Number 157.
2. Field Mus. Nat. Hist.—Bot. 23: 66, 1944; re-



- printed in *Cact. Succ. Journ. Amer.* 16: 126, 1944.
3. *Kakt. und Sukk.* 9: 23, 1958.
  4. R. H. S. Horticultural Color Chart.
  5. Counted by Mildred Thompson of the Botanical Garden staff; her cytological studies of *Disocactus* and its allies will be presented in the author's forthcoming revision of the group.
  6. Kimnach, M. and P. C. Hutchison, *Cact. Succ. Journ. Amer.* 29: 75-79, 1957.
  7. *Cactaceae* 4: 177, 1923.
  8. *Cactaceae* 4: 203, 1923.
  9. *Cact. Succ. Journ. Amer.* 30: 80-83, 1958.
  10. *Cact. Succ. Journ. Amer.* 19: 95, 1947.

#### IMPORTING LARGE CACTI

The following is an interpretation of the new ruling limiting the size of cacti that can be imported.

As mentioned in the administrative instructions the purpose of the size limitation is to reduce the plant pest risk incident to the importation of the plants named and to allow a more thorough inspection than is possible with larger plants. In the past there have been large commercial shipments offered for entry in which the individual plants had trunks or stems from 6 to 8 inches in diameter and up to seven feet in length. Material of this size and age represents a considerably greater risk of pest introduction than do small, young plants and often presents a difficult inspection and treatment problem as well.

In the administrative instructions, it will be noted that provision is made for the entry of specimen plants in accordance with the conditions prescribed for specimen plants in Regulation No. 18(a) of Quarantine No. 37. Specimen plants so allowed are not subject to the 12 inch size limitation.

Persons wishing to import specimen plants, should write to the Permit Section of this Division, 209 River Street, Hoboken, New Jersey, outlining the need for the larger plants. If entry can be allowed under conditions that will not increase the risk of pest introduction permits can be issued or amended to authorize the importation. In general such permits will not be issued for commercial importations but

will be limited to arboretums, botanical gardens and collectors specializing in the plant genera concerned.

Unfortunately the notice which appeared in the March-April 1959 issue of the *Cactus and Succulent Journal* made no mention of the provision for entry of specimen plants.

#### NEW SPECIES

Here are just a few of the new species that have been published in various publications within the last few months. Who says that the study of succulents has become static?

*Neodawsonia totolapensis* Bravo in *Anales del Instituto de Biología*.

*Neodawsonia nizandensis* Bravo—same.

*Horridocactus engleri* Ritter in *Succulenta*.

*Horridocactus eriozoides* Ritter in *Succulenta*.

*Oroya laxiareolata* Rauh et Backeberg in *Kakteen und Andere Sukkulente*.

*Aloe venusta* Reynolds in *The Journal of South African Botany*. A new *Aloe* from Tanganyika Territory.

*Aloe massawana* Reynolds—same. A new *Aloe* from Eritrea.

(Note: Dr. G. W. Reynolds reports, "During the last eight years I have been travelling extensively almost throughout Africa investigating the aloes as far north as the Red Sea gathering data, photographs, etc. for my next monograph which will be *The Aloes of Tropical Africa and Madagascar*. I now have only Angola to do to finish my African programme.")

*Echeveria goldiana* Walther in *Cactaceas y Suculentas Mexicanas*.

*Echeveria meyranaiana* Walther—same.



FIG. 62. *Furcraea selloa* var. *marginata* growing at the Adelaide Botanic Gardens

## CULTIVATED AND NATIVE AGAVES IN THE SOUTHWESTERN UNITED STATES

AUGUST J. BREITUNG

1416 S. Glendale Ave., Glendale, California

### PART 4

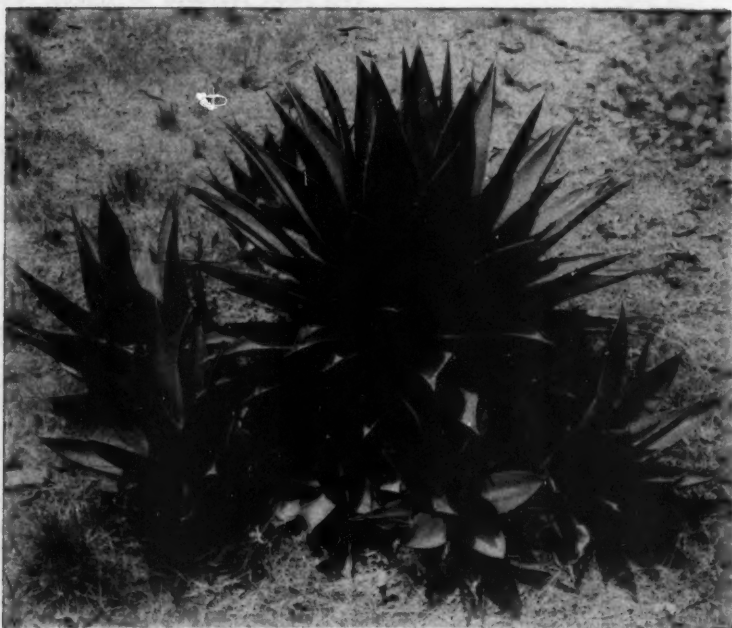


FIG. 63

*Agave purpusorum*. Grown by the University of California Botanical Garden, Los Angeles, California. Approx. 1/8 natural size.

***Agave purpusorum* Berger, Die Agaven 111, 1915.**

Distribution: type cultivated in Europe, collected by C. A. Purpus (No. 465) from Puebla near Tehuacan.

Rosette 70 cm. in diameter, 40 cm. high, caespitose; leaves thick, stiff, clear green, broadly pale-striped above, not dark-lined beneath, 25 cm. long, 6 cm. broad, slightly narrowed toward the 25 mm. thick base; armature at first chestnut brown, eventually becoming gray; spine 1 cm. long, sides decurrent into the continuous .5 mm. broad horny leaf margins; teeth 10 to 15 mm. apart, 5 to 8 mm. long; flowers not known to writer.

***Agave roezliana* Baker, Garden Chron. new ser. 7: 528, 1877.**

Distribution: type cultivated in Europe, collected by C. A. Purpus (No. 419) from Puebla near Tehuacan.

Rosette 1.60 m. in diameter, 1.30 m. high, caespitose; leaves 30 to 65 cm. long, 8 to 12 cm. broad, glabrous, light green, a broad light median stripe above, no dark lines beneath; spine and teeth chestnut brown at first, becoming gray; spine 2 to 3 cm. long, decurrent into the continuous horny 2 mm. wide margins; teeth 8 to 40 mm. apart, 5 to 10 mm. long, usually curved upwards or irregular, often with 1 or 2 smaller ones between the larger ones; inflorescence unknown to writer.

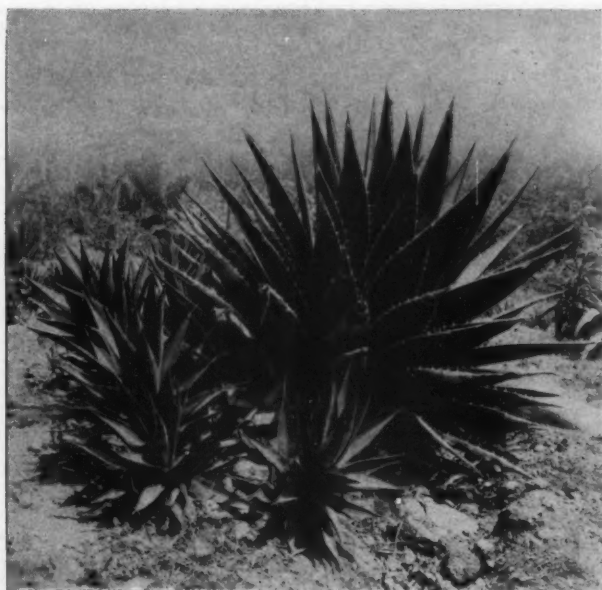


FIG. 64  
*Agave roezliana*. Grown by L. Ellenwood, San Fernando, California.  
Approx. 1/16 natural size.



FIG. 65  
*Agave ghiesbreghtii*. Left: grown by J. Buttner, Fallbrook, California.  
Right: grown in Huntington Botanical Garden, San Marino, California.  
Rosette approx. 1/7 natural size.

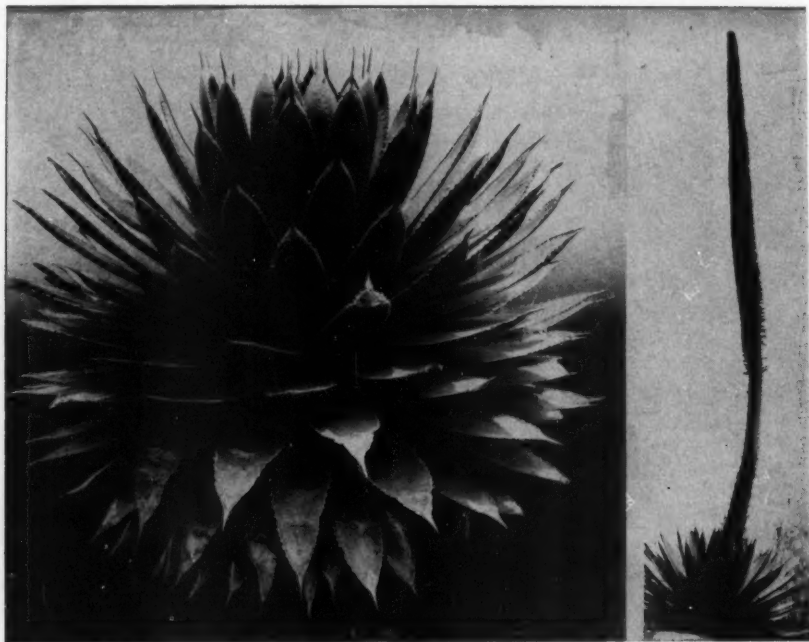


FIG. 66

*Agave horrida*. Grown by L. Ellenwood, San Fernando, California.  
Rosette approx. 1/8 natural size; inflorescence greatly reduced.



FIG. 67

*Agave horrida* var. *gilbeyi*. Grown by H. S. Gentry, Murietta,  
California. Approx. 1/3 natural size.



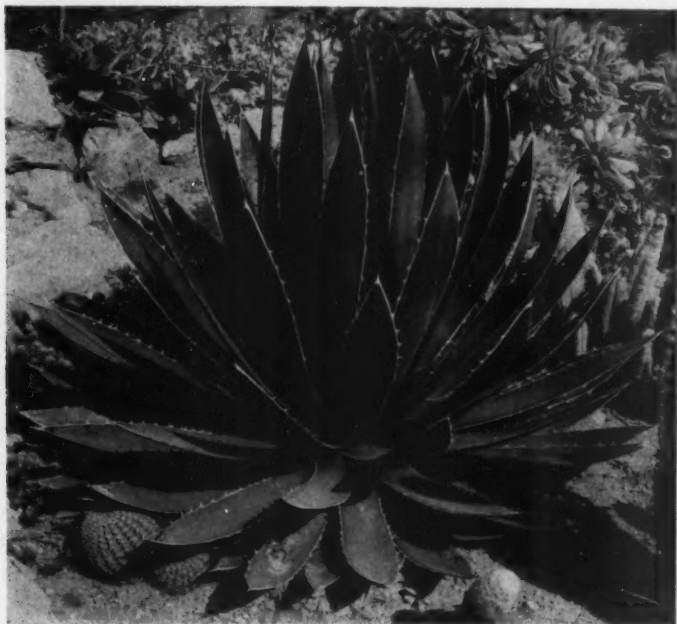


FIG. 68  
*Agave obscura*. Grown by J. Buttner, Fallbrook, California.  
Approx. 1/12 natural size.

*Agave ghiesbreghtii* Koch, Wochenschr. Ver. Beford, Gartenb. 5: 83, 1862.

Distribution: type cultivated in Europe without recorded locality.

Rosette usually with numerous offsets, eventually mound-forming, 50 to 70 cm. in diameter; leaves upcurving, concave, fleshy, grayish-green or bluish-green with faint ventral stripe and no dorsal lines, 25 to 40 cm. long 8 to 12 cm. broad; armature brown at first, soon becoming gray; spine 15 mm. long decurrent into the continuous 1 to 2 mm. wide horny leaf margin, entire above, lower three quarters armed with triangular teeth, 12 to 15 mm. apart, 3 to 5 mm. long; inflorescence 2.5 to 4m. high. Flowers March-May.

*Agave horrida* Jacobi, Ham. Gart. Zeit. 20: 546, 1864.

Distribution: Morelos, abundant above Cuernavaca on the lava fields, type cultivated in Europe without citation of locality.

Rosette single, 80 cm. in diameter; leaves numerous, uniformly spreading, 30 cm. long, 5 to 7.5 cm. wide; light green, rarely with pale ventral stripe and no dorsal lines; armature at first brown, soon becoming gray, spine 2.5 to 3 cm. long, decurrent into the 2 to 3 mm. wide undulate horny margin; teeth large, flat, variously curved and hooked, 10 to 15 mm. apart 5 to 10 mm. long; inflorescence 5 m. high, very dense. Two plants were observed flowering at L. Ellenwood's in 1956 and 1957. March-May.

*Agave horrida* var. *gilbeyi* Baker, Gard. Chron. 621, 1877.

*A. gilbeyi* Hort. Haage & Schmidt, Gard. Chron. 1305, 1873.

*A. roezliana* var. *nana* (Laurentius) Trelease in Standley, Trees & Shrubs of Mexico, Cont. U.S. Nat. Herb. 23(1): 137, 1920.

Distribution: type cultivated in Europe from Tehuacan.

Distinguished from the typical species by its small size, rosette 30 cm. in diameter, leaves 15 cm. long, spine stout 2 to 3 cm. long, 6 mm. broad at base decurrent into the

continuous 2 to 3 mm. broad horny border, teeth 3 to 6 mm. long. Flowers unknown to writer.

*Agave obscura* Schiede, *Linnaea* 18: 413, 1844.

*Agave grandidentata* Jacobi, *Hamb. Gart. Zeit.* 22: 114, 1866.

*Agave horrida* var. *micracantha* Baker, *Gard. Chron. new series*, 7: 621, 1877.

Distribution: Veracruz; common on the lava beds about Limón; type locality, lava fields of La Joya.

Rosette single, 1.30 m. in diameter, leaves uniformly spreading, 45 to 60 cm. long, 10 cm. wide, dark green, stiff without light ventral stripe and no dark dorsal lines; armature at first brown, soon gray; spine 25 to 30 mm. long, decurrent into the 1 to 2 mm. wide horny margins; teeth triangular, straight or variously curved, 10 to 40 (average 20 to 30) mm. apart, 4 to 7 mm. long, flowers unknown to writer.

## DESERT FLOWERS UNDER GLASS

*The story of my experiences and delight in growing and flowering Cacti and Succulents in a small glasshouse in Christchurch, New Zealand*

By MARJORIE E. SHIELDS

### CHAPTER 13.

On the bench below the Beautiful Shelf is the last group along this side. These are the little *Rebutias*, looking so charming with their circles of beautiful flowers. This group was named after P. Rebut, a cactus dealer. All are from South America, usually being found in Argentina and Brazil. The plants being small take up little room and as they flower so freely and when quite young, can be recommended to those with limited space for displaying their treasures. When not in flower however,—and they have one period of blooming only—they are not spectacular; just neat clusters of small tubercled plants—like and yet unlike some *Mammillarias*. As the sun is very hot in this Valley they need the broken sunlight provided by the *Aloes* behind them, this arrangement suiting them perfectly. If given well drained porous soil, plenty of water in summer and kept dry during the three winter months they will repay with a glorious display in the spring. Reminiscent of miniature crocuses aren't they, with their cup shaped flowers and loosely arranged stamens which appear to hang suspended and shine like glow worms in their differently coloured grottos? Most of mine are in various shades of red which is rather disappointing, especially as some could be either red or yellow. But we will find a salmon, a pink, a cerise, a buff and a yellow to add a little variety. *Rebutias* appear to be in two groups, those with the flowers produced in a circle around the base of the plant and those with their blossoms appearing on the elongated stem. Seed sets very readily, the pods soon bursting to spill their contents into the soil around the plant.

The first to flower is usually *R. violaciflora*. This name is really a misnomer, for these blossoms are brilliant cerise or shining rosy violet rather than real violet—a most unusual and striking colour. The flower is larger than some and its many white stamens and extended style with five white stigma lobes, and the clear colour of the wide recurved petals make it quite outstanding. *R. xanthocarpa* follows with smaller orange-red blossoms, soon to be replaced by the "yellow fruits" which give it its name. Then comes *R. minuscula*, meaning "rather small", and *R. pseudo-minuscula* with identically coloured fiery red flowers with long slender tubes. The difference between these two plants is that the latter is cylindrical and produces flowers and offsets from the side of the stem, whereas the former is a round flattish plant producing its flowers and offsets from the base. It looks really intriguing just now with its complete ring of babies, all exactly the same size, evenly spaced around it and between them and the mother plant a circle of bright red blossoms with some of the babies adding their flowers to the display. But look at *R. steinmannii*, with perhaps the smallest flowers, only an inch across. But what a glorious deep red they are! The wide petals breaking from a very short tube form a cup shaped flower and from the white throat long white filaments reach almost to the rim. The plant is a picture with its smother of blossoms.

Then there is *R. ritteri*. What could be lovelier? The two inch carmine flower, with a short tube and rounded petal tips, differs from the others in that it has a deep maroon throat, almost purplish, with a suggestion of the same purplish tinge colouring the outer petals. *R.*



FIG. 69

Top left, *Rebutia violaciflora*. Top right, *R. minuscula*. Center left, *R. steinmannii*. Center right, *R. ritteri*. Bottom left, *R. pseudo-deminuta*. Bottom right, *R. senilis*.



FIG. 70

Top left, *Rebutia haagei*. Top right, *R. Blossfeld's No. 6*. Center left, *R. duarsmaiana*. Center right, *R. fiebrigii*. Bottom left, *Erdisia maxima*. Bottom right, *Rebutia krainziana*.



senilis, covered with glistening white spines also has a large carmine flower with a long tube, pointed petals and short stamens. Here is another with flowers and offsets coming from the side of the plant, *R. pseudo-deminuta*. According to some authorities the flowers may be either golden yellow or red. Mine are red! However this is a very striking plant and I am glad to have it in my collection. Here is one that is not red—beautiful *R. haagei*, probably named after F. J. Haage Jr. One authority says this flower is clear pink. Mine is pink—a deep salmon fading almost to buff, with a tinge of bronze green on the back petals. The petals are wide, rounded at the top and come to a blunt point. This plant also grows its flowers on the side of its body. A very lovely *Rebutia*.

Blossfeld's No. 6, similar to many of the others, is another orange red one with nothing outstanding about it, except its many blossoms. *R. duursmaiana* should be orange yellow, but mine? Yes, again it is red, orange red, but all the same it has a complete circle of flowers and is doing its best to compensate for my disappointment. Then there is *R. fiebrigii* one of the loveliest. It was found in Bolivia and was called after Dr. C. Fieberg, Director of Gardens at Paraguay. The plant is covered with short, fine, glassy, white spines, with somewhat longer coarser ones intermingling. Glistening in the sun it is very showy even without flowers, but when covered with its yellowish red blossoms, nestling amongst those white spines, it has an almost unbelievable beauty. Another with orange red flowers is *R. calliantha*, meaning "having beautiful flowers". Living up to its name, the flower is beautiful, being medium sized, funnel shaped with narrow petals; while the orange throat is filled with yellow stamens and waving over all is the long style with its branched stigma lobes.

Here is a differently coloured one—*R. salmonea* with a small salmon flower. A very welcome change after all the red blooms. *R. wessneriana* is also a little different with its narrow, sharply pointed, glowing, velvety red petals, shading to clear orange in the throat; the colour really glows. This flower has a longish, thin red tube. Ah! At last, a yellow one! *R. chrysacantha lutea*, the "golden" plant. With its golden spines, and brilliant clear yellow blossoms covering its body, its beauty almost takes one's breath away. And lastly the largest flower of them all—*R. krainziana*, named after H. Krainz. These flowers are magnificent, easily 2½ inches across, pillar-box red with wide recurved petals. Why they are larger than the plant itself and look more like a *Lobelia* than a *Rebutia*. A really glorious blossom.

Shading the *Rebutias*, *Adromischus* and *Echinopsis* from too much attention from the hot

morning sun are some of the tall growing *Aloes*, together with the rest of the tall *Cerei* which are not in the *Cereus* corner. None of these *Cerei* have flowered, but with them is *Erdisia maxima*, a tall, slender growing cactus from Peru and Chili and named after E. C. Erdi of the Yale Peruvian Expedition of 1914. *Maxima* meaning the "largest or greatest" does not refer to the flower which is only about 2 inches across and small for the height of the plant. The blossom has its beauty though, being many petalled, the inner red the outer overlaid with gold glistening and sparkling in the sunlight. The throat is filled with stamens graduating in length down the tube. These are red with biscuit coloured anthers and the short red style breaks into pinkish white stigma lobes. This flower appears about a couple of inches from the top of a foot long stem.

Even though none of the *Cerei* have flowered, the monstrose forms are interesting. Some are tall with stems tortured into many queer shapes, but the most fascinating are the miniatures in 3 inch pots. These are many headed; some so tiny the heads are less than ¼ of an inch across and packed tightly together to form a dense mound and so thickly covered with fine hair-like spines they look like burrs or bidibidis. All came from the same packet of seed labelled *Cereus peruvianus monstrosus*, but no two are alike. Nor are they the same colour, some having bright grass green bodies with golden spines, others dark blue green bodies and brown spines and this one with the purplish body has almost black spines. Most interesting little specimens.

#### WEEDS

(From New Zealand Cactus and Succulent Journal)

Cactus is in trouble again in Australia. This time it is *Harrisia martinii*, which is reported to be ten times as bad as prickly pear. The N. Z. Herald of December 9th carried a story of 100,000 acres in North Queensland being over-run by the pest. The Queensland Government has sent a scientist to America in search of a destroyer, and warned gardeners to dig it out of their backyards and burn it. The article goes on to say that the plant was introduced from South America many years ago as an ornamental domestic pot-plant.

If the facts concerning the spread of the plant are as accurate as the name and location of its origin, it sounds like bad news indeed. *H. martinii* is a sprawling plant, branched, its color green, passing to grayish green. The flowers are large, 9 or 10 inches in length, the outer petals pale green with reddish tips, inner petals white. Fruit is red, round, warty and spiny. It comes from Argentina.

#### METROPOLITAN CACTUS & SUCCULENT SOCIETY

We are a young and growing club created for the purpose of furthering the interest, care, and culture of Cacti & Succulents. We meet on the second Friday of each month at 7:30 PM in the Lawndale Optometrist Club at 15628 Hawthorne Blvd., Lawndale, Calif.

Visitors are always welcome.

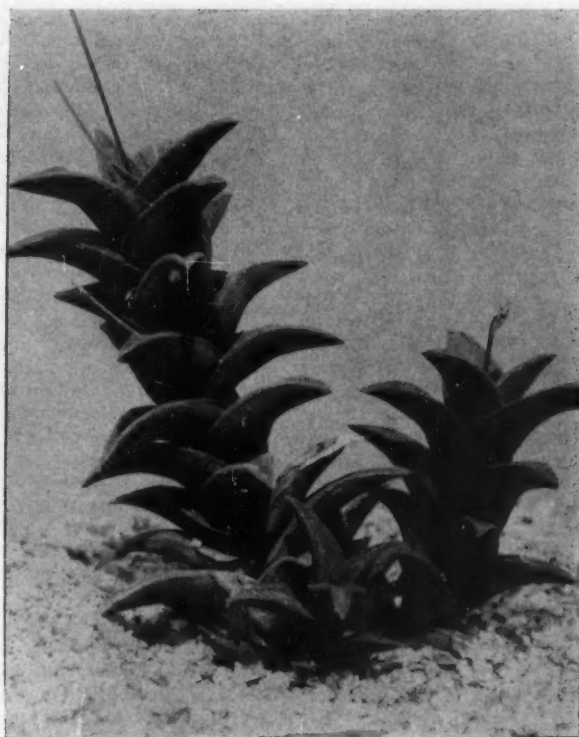


FIG. 71

*Haworthia bearii* var. *minor* G. G. Smith nat. size

## Notes on *Haworthias*

J. R. BROWN

*Haworthia bearii* var. *minor* G. G. Smith in Journ. So. Afr. Bot. X (1944) 138, Pl. 4 & fig 2

Plant with more or less erect leafy stems to 8 cm. tall, 4-4.5 cm. diam., proliferous from the base and forming clusters.

Leaves in 3 spiralling rows, imbricated, spreading, 2-2.5 cm. long, 14 mm. broad towards base, about 4 mm. thick at middle of leaf, the sheathing leaf base extending about 5 mm. beyond stem, ovate, acute, cuspidate, recurved; face of leaf concave, concave-triangular towards tip, minutely scabrous in upper  $\frac{2}{3}$ , the young leaves light green, becoming dark green with age, dull; back of leaf convex, triangular towards tip, minutely scabrous in upper  $\frac{3}{4}$ , dull dark green, obliquely keeled in upper  $\frac{2}{5}$ , car-

tilaginous near tip; margins acute in lower part, obtuse above, scabrous and concolorous.

Locality: South Africa: Cape Province; Humansdorp Distr. near Patentie.

G. G. Smith states that compared with the species the leaves are much smaller and more loosely arranged, the plant is more proliferous and the pedicels are longer, the pedicels of *Haw. bearii* G. G. Smith 4.5-5 mm. long those of var. *minor* 7 mm. in length. The var. *minor* appears to be the more attractive of the two due to the more loosely arranged leaves.

A photo showing the leaves and the clasping or sheathing leaf bases of *Haworthias* of the sect. *Trifariae* is included here and while this is not *Haw. bearii* var. *minor* is a *Haworthia* closely related and is used to illustrate the leaf shape of this section:



FIG. 72  
Leaves of *Haworthia* sp. showing the claspings leaf bases. enlarged

*Haworthia reinwardtii* var. *diminuta* G. G. Smith in Journ. So. Afr. Bot. XIV (1949) 52, Pl. 8 & fig. 4

Plant with leafy stems to 5.5 cm. tall, to 3 cm. diam., proliferous from the base and forming clusters.

Leaves crowded, multifarious, ascending, incurved, 2 cm. long, 6 mm. broad towards the base, to 3 mm. thick lanceolate, acuminate, cuspidate; face of leaf green, convex, with a raised lengthwise line on which are a few very small round to transversely oblong whitish tubercles, and often with a row of similar tubercles on each side of the middle row; back rounded, more

or less reddish-green, with 12 irregular transverse and 5 regular lengthwise rows of round to transversely oblong solitary, small, prominent white tubercles; obtusely keeled, the tubercles on the keel more oblong and about 1.5 mm. apart at the middle of the leaf.

Locality: South Africa: Cape Province; Albany Distr.

As the name implies this is a very small form of *Haw. reinwardtii*, presenting "a uniformly white-peppered appearance" and while the author states that *Haw. reinwardtii* var. *bellula* is a smaller plant, in cultivation var. *bellula* tends to have slightly longer stems with age.

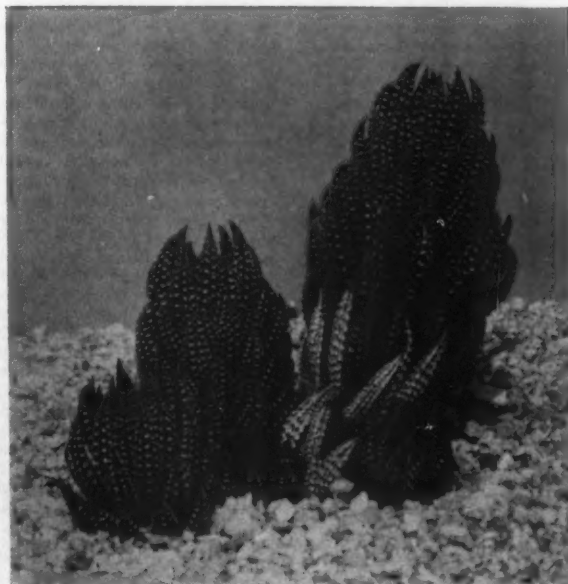


FIG. 73  
*Haworthia reinwardtii* var. *diminuta* G. G. Smith nat. size

## SPOTLIGHT ON ROUND ROBINS

A Robin in the hand is worth two in the bush, to paraphrase the old saying, and especially to those who participate in them. Therefore it is a particular pleasure to list the new members who will discover the truth of these words. They are Mr. W. W. Atkinson, Shrewsbury, Shropshire, England; Mrs. Barbara Isbell, Oceanside, California; Mrs. Cathleen E. Duncan, Lower Hutt, Wellington, New Zealand; Mrs. W. P. Macarthur, Herne Bay Auckland, New Zealand; Mr. Glenn N. Brown, Seattle, Washington; Mrs. Theoda E. Haskell, Calgary, Alberta, Canada.

New Robins still are looking for members to complete route lists. The *Opuntia* Robin is one which has made very slow progress towards a minimum membership and could use several more before getting into flight. One tentative member wrote, "With about four hundred known species of *Opuntias* (to collect) what more do you want?" So, those who are *Opuntia* collectors, let me hear from you. Several quick replies came in for the Rare Cacti and Crests Robin. More members would be appreciated for this and if any of our Journal members are from Mexico or South America it would be particularly gratifying to have them join this Robin or any other which appeals to them. The Seed Propagation Robin, subtitled Wildcat No. 1, took flight earlier with three members. It was decided to limit membership to five in all, and only to those who use a typewriter, since it is planned for each member to make enough copies of his own letters that every member may have a copy to keep for reference. So, are there two members who would like to belong to this group? The Director is Mr. J. Robert Walton who, by the way, has a private enterprise to supply cards for cataloguing plant collections. The Decorator's Robin would like two or three members. For anyone who enjoys making arrangements with plant material this Robin would be fascinating and challenging to your skill and ingenuity in the use of succulents in arrangements. It offers more than passing interest because the making of arrangements includes not only the knowledge of plants and their culture but all the accessories used, from pebbles, rocks and shells to containers and figurines, nice hobbies in themselves, and useful to enhance the succulent material. I do hope some of you will consider joining this Robin.

I am pleased to report that the *Echeveria* Robin has filled its membership and made its first round under the direction of Mrs. Lloydene Dodd. This Robin as well as others has found the articles written by Mrs. Marjorie Shields a great inspiration and many compliments have been flying around since they appeared in our Journal.

Besides the above Robins, I have had inquiries for a Rain Forest Plants Robin featuring more those plants other than *Epiphyllums*, another *Mammillaria* Robin (No. 2), another Succulents Only Robin (No. 2), a *Stapelia* Robin and a new *Euphorbia* Robin No. 3, and finally another Window Sill Robin No. 2, the name of which seems to appeal to those members having just a few plants. If anyone would like to join one or more of these Round Robins just drop me a letter or card. Be sure to let me know if you are a member of our Cactus and Succulent Society of America and I shall be glad to place you as soon as a Robin is ready.

The notes taken from the Robins have had much about the past severe winter and plant losses. From Oklahoma Gilbert Taylor told of an early freeze last December which damaged some of his hardy plants. Then he said, "In January 1959 we had a total of

nine inches of snow and low temperatures for three days of 6°, -7° and -11° F. This froze more of my outdoor plants. However, where I had from three to five of some plants, some froze while others planted beside them survived. One plant I have had outdoors since 1946 was severely damaged. I have only two of the six plants of *Echinocereus triglochidiatus* I collected in the mountains of New Mexico at 9,000 feet elevation. I lost a few *Opuntias* from extreme cold also." Arthur Wells in Pennsylvania wrote, "My cold frame took a very severe beating this year and it would take more than \$50 to replace my losses at catalog prices. Fine plants which survived other winters well, froze and rotted. As in former years the losses were inconsistent—some freezing and others beside them safe". Billie Marie Anderson said her losses were not as great as she at first feared but she added, "What beats me is several succulents and leafy vine-like plants I'd have bet would freeze, were not even damaged. I had set a hanging planter I'd removed plants from right out in the open with two or three little clusters still in it or fat juicy leaves. They took the rains, ice, freezing winds—everything we had tossed at us this winter (in Texas)". In another Robin, No. 6, she wrote of the "royal mess" in the yard. "Cartwheel *Opuntia* completely gone, Chain Cholla, I am afraid all gone and so many partly gone and must be cleaned out." Of her lath house she said, "Everything froze stiff and hard. The totem Poles, though ICE Totem Poles for several days, are OK but except for a Milk tree, Elephant bush and part of Jade and one or two others, nothing hurt".

In a number of Robins certain plants have been written about and the information seemed helpful or interesting as the case may be. Glenn Webb wrote, "*Homalocephala texensis* has been outdoors with a temperature of 19°F. None seemed harmed. My big plant has bloomed every year except the first I had it and it was in fruit when it was sent. This plant seems to take intense sun and probably heat-effect too. As far as I know no one has explored the heat-effect necessary for cactus growth separate from light." Frances Anderson had this to say about her Red Paramount and another Paramount Hybrid, "Last year when they bloomed they looked the same color but Red Paramount's second blooming came out red. Catalog says its color is variable. Early flowers are pinkish with orange." The Reverend Leonard Gams-ton remarked, "I discovered that the *Echeveria gibbiflora* var. *metallica* is losing some of its leaves in that they shrivel up at the end. Despite all my care I can not prevent this leaf curling taking place." To this Roy Strange replied, "Don't worry over the *Echeveria* losing its bottom leaves. It is a natural thing for it to do. To ease it, a little more water should be given and kept in a warmer place. Old plants do get rather leggy with only a few leaves left on top. It is best to cut off the top and reroot." He added, "Of course *Echeverias*, *Bryophyllums* and some *Sedums* grow normally at this time of year and rest in summer." Also he had this to say about *Rebutias*, "I found out to my regret that *Rebutias* are not at all hardy. I lost a number of choice plants one year when I allowed the greenhouse temperature to get down to freezing point. I think *Rebutias*, for their size, are the most prolific and showy cactus plants there are and they bloom when quite small. There is also a very good range from yellow to deep red".

Ida Pruett commented in her letter, "Recently I bought a *Lophophora schottii monstrosus* (Totem Pole). It is fourteen inches tall, stout green body. It



has been described as one of the oddest plants in nature and when one sees it for the first time it is an apt description. I carried it to the monthly meeting of our Federation of Garden Clubs and could hardly convince people it was a real live plant. As far as I know it is propagated only by cuttings and they require from one to two years to strike roots". There was discussion in the International Mammillaria Robin of *Mammillaria lasiacantha* when Marion Turnock asked, "Is it a very slow growing plant? I have some tiny, tiny seedlings barely showing above the soil level after twelve months and only a quarter inch diameter".

Julia Free made a trip to the Big Bend Country of Texas and wrote, "It is a thrill to find cacti growing, but you have to climb hills and push through more or less thorny brush. I found a nice *Coryphantha muelenfordii* and a beautiful *Mammillaria meiacantha*. The country is getting drier all the time and I am afraid in a few years there won't be any cacti left but *Opuntias* and *Yucca* types. The Rainbows are disappearing but *Echinocactus horizontalis* seems to be holding its own the best of any. Until they are larger than a dollar they are under the ground. There were lots of *Mam. lasiacantha*, some no larger than a dime with four blooms on them. My biggest thrill was finding *Epithelantha micromeris*. I only found a few growing right in the limestone and hard to see. Most of the plants were growing in hard caliche—no sand at all". Harry Barwick says in regard to the question of whether *Mam. lasiacantha* is very slow growing, "It is in the text on this plant in Craig. Usually you can tell from the size of the plant but in this case it has to be coupled with the type of body, generally simple but sometimes offsetting above the base. I doubt if Julia found them in dense clusters. Very often distribution will tell you something, and does, for it is confined to a comparatively small area. Growing high and dry is another factor, plus the bedfellows *E. horizontalis*, *E. rigidissimus* and cylindric *Opuntias*, equally slow and hard to grow". Mona B. Mott has a suggestion for rerooting ball or barrel cacti which might be useful to someone. She says, "Scoop out the centers to clean live tissue, dust with sulphur, let heal, then fill the hole with clean sand, set up on the soil and they will grow a new bottom. I did a couple like this which I would have thrown away and they are once more growing on their own roots". She added, "I still say the secret of the do's and don'ts pertaining to cacti and succulent growing is right in the medium in which they are kept. I've found that NONE really like wet feet".

Imagine all of us would like to transport ourselves to England to see the fine collection of Leslie Tookey which he says "consists of some 2,000 plants, and these days I keep the lesser known varieties. Last year six species of *Ariocarpus* flowered well for me together with *Obregonias*, *Pelycyphoras*, *Lophophoras*, *Aztekiums*, many *Coryphanthas*, *Encenphalocarpus*, *Mammilopsis*, *Astrophytums*, *Copiapoas*, *Epithelanthas*, *Coloradoas*, *Thelocactus*, *Strombocactus*, *Stenocactus*, all of these being imported plants. Most imported plants settle down quite well, taking about two years to establish".

Before I close I should like to say that it has seemed best to add a new rule to the few we have in our Robins. It is that members who hold and delay Robins without reason and unnecessarily may be dropped from the Robin list. This need not be of too much concern to those of our members who have been prompt and faithful in speeding Robin letters along, nor to those who through circumstance have been unable to mail the Robins as they should, but I do hope it may be helpful towards eliminating lost

Robins. Indeed, the faster and more often a Robin can fly, the more pleasure it brings and the better we are kept in touch with our Robin friends. Don't forget to write if you are interested to belong to a Robin. There are no dues but you must be a member of our Cactus and Succulent Society of America. My best wishes to you all and happy and speedy Robin flights.

(MRS.) GLADYS H. PANIS

P. O. Box 705, Falmouth, Massachusetts

#### EL PASO CACTUS & ROCK CLUB

It is hard to assemble all the news items, but I have been asked to be reporter to the Journal by the El Paso Cactus Club for 1959, and will attempt to cover part of the past six months for you. Clark Champie, our president, is editing a bulletin which is sent out monthly. This shows our programs and related happenings.

Dr. Peter Duisberg has been in Chile on a Fulbright scholarship, and is returning shortly to El Paso. In a recent letter he promised to send us some cacti from Chile. A newspaper picture which he sent, shows two cacti identified as *Copiapoa haseltoniana* and *Copiapoa spec. nov.*

Clark Champie is going into the cactus business in earnest, having resigned from his teaching position. He will specialize in local plants from seeds, and already has thousands on hand. With civilization creeping up on the cactus haunts, he feels something should be done to save the beauties from extinction.

Tony Evanoski, who has won many photography awards, has developed a method of showing the development of the cacti flowers such as *Peniocereus greggii*, in time-interval pictures. He has pictures of the cameras as they are set up and will write up other pertinent information if the journal would like such an article. The pictures look like the lovely Walt Disney sequences of flowers opening.

The city's plan for an East Franklin Park and botanical garden fell apart due to some right-of-way difficulty. Now we are promised a five acre area inside the city which the Cactus Club will help plan and plant, and the park department will take care of the upkeep. The first necessity is a vandal-proof fence. Just as the county of El Paso was about to auction off some acreage at the mountain crest, Clark Champie and Burt Gurney went to the Commissioners and pointed out the value of the section as a park. They presented pictures of waterfalls, trees, and rare flora, and convinced the Board.

Please put my name on the list of those wanting a copy of Marjorie Shield's articles, if assembled in book form. I like the combination of folksy and scientific writing.

MRS. JAMES S. BROWN  
5201 Timberwolf Dr.  
El Paso, Texas

#### FROM MORRISTOWN, N. J.

I can answer part of the question asked by Ted Hutchison on page 25 of the Jan.-Feb. 1959 Journal. *Astrophytum myriostigma* does exhibit characteristics similar to those he described for *A. capricorne*. Seven years ago we got a dog who did considerable damage to one of my prized *A. myriostigma*, three inches in diameter, which I acquired about 1948 from Johnsons Cactus Garden when we lived in N. Hollywood, California (it came east with us in 1951 and survived the trip across the country packed in a wooden case with other cacti and then two months storage in a warehouse until we settled in our new home).

The dog chewed up the base of one of the five wings of this Bishop's Cap. The wound readily calloused, but as the plant continued to grow it became distorted and lop-sided due to tissue shrinkage around the wound. Last year I decided that the plant's symmetry would never be restored so I cut off the top above the wound, and somewhat to my surprise was able to root it readily. Base of the cut was almost two inches in diameter; it was dusted with Rootone, allowed to callous and then rooted in pure sand. It has already started to grow again this year.

The cut surface of the stock became calloused and I continued to treat it as a normal plant, with some interest to see what would happen, and hoping to have some pups develop at the areoles. This never happened but almost three months later a fissure developed across the scar and soon the beginnings of a new plantlet appeared from it. Eventually, five new plants developed, all from the same crack in the callous. None have come from areoles. These pups are now one-half inch in diameter, although, because they are jammed so closely together, it is difficult to say of certainty; two appear to be 5-angled, two are 6-angled, and one has 7 angles. But perhaps as they become large, the extra wings will stop growing and all plants will revert to 5-angles like their parent. I intend to let them grow larger before severing them sometime this summer.

This particular plant, until I lopped it, had been growing quite slowly. Soil in the pot didn't drain too well and perhaps I was over-watering. For several years it grew hardly at all, but after repotting about three years ago it started coming around, and regularly set flower buds. These often blasted, I think from becoming wet when it rained.

The following list of cacti which have flowered for me here in New Jersey may be of interest to you. It seems to me that dryness and coolness during the winter rest are the most important requirements; the plants are out in the open during the summer and I water with a complete fertilizer solution (Rapid-Gro) every few weeks during the growing period.

*A. myriostigma*

*A. capricorne*

*Rebutia senilis* (profusely sets seed)

*Mammillaria hahniana*

*Pyrrhocactus horridus* (profusely and recurrent)

*Echinocereus fitchii* (starts early, recurrent)

*Echinopsis* sp.

*Echinopsis* "Los Angeles"

*Gymnocylindium damsii* (indoors, recurrent)

*Hamatocactus setispinus* (recurrent)

*Lithops lesliei* (not a cactus but it blooms)

*Lophophora williamsii* (recurrent, sets occasional seeds. In a 4-in. pot since 1947, two years ago sent out pups through the areoles and continues to do so, now has nine ranging from 1/2-3/4 in. diam. parent is 2 in. diam.)

*Notocactus leninghausii* (a large cluster flowers profusely and sets seed)

*Parodia scapoides* (weak root system — perhaps I over-water)

*Schlumbergera* sp. (bought as Christmas Cactus, blooms indoors in east window from end of November through March).

H. S. LEVENSON

Box 581, Morristown, N.J.

#### NEWS FROM THE I.S.I.

There have been a number of inquiries from interested persons regarding the International Succulent Institute, Inc., how we operate; what we are attempting to do; also some requests for an explanation of our plant listings and prices.

We are a non-profit organization and incorporated as such. Our members do all the work of securing, propagating, packing and shipping, without being paid for their services. All of this work must be done on weekends, or evenings, as all have their regular jobs to fill. For this reason we need four to six weeks in which to fill your orders.

There is a tremendous amount of work to be done before a plant is ready for shipment. First there is the research. It may take many hours of diligent search to locate and study the literature of even a single species. This historical data may be published in several places in various magazines and books, and in several languages. The information must then be re-written in a form more interesting to our readers and then published. When we receive plants for the I.S.I. each must be given special care, to eliminate pathogens and parasites and to provide favorable growing conditions. Even then they must be carefully watched to avoid future infestations. They must be fertilized at frequent intervals and constantly cared for until they leave our hands. The raising of seedlings of difficult species also takes considerable time, much skill and knowledge. We also have such items as printed matter, literature, labels and stationery, much of which is supplied free by one of our members. Many letters are received, all of which we try to answer, and as there is no paid typist or secretary this too is done by our members without cost to our institute. Certainly if we had to hire help at today's

wages to do these things, we could not hope to continue in this venture.

Most of the plants that we offer have carefully recorded histories. This is one of the principal reasons for our organization. Most of our offerings are grown from field-collected plants and seed. Unless the seed is collected in the field or produced in cultivation under rigidly controlled conditions, the plants resulting may be hybrids. This control is done for all I.S.I. seed so that plants secured from the I.S.I. will be true species, whereas plants of the same name secured from many other sources may be hybrids. I.S.I. plants are, therefore, more valuable to the serious collector and to botanical gardens, because of their known origin and history. It is not our intent to furnish "just succulent plants". Those who want such material can obtain it elsewhere and quite reasonably priced. Outside of our organization there is no source that we know of which performs the service of furnishing annotated plants for the careful collector, the plant connoisseur, botanical gardens, and other scientific institutions.

The I.S.I. makes every effort to correctly identify its offerings. One commercial dealer has said that it is worth \$1.00 to him just to obtain the correct name for a plant. It takes considerable experience and a valuable library to identify species. With such a vast group of succulents it is inevitable that occasionally one of our distributions will be mis-named. However, corrections will be mentioned as soon as possible in our later lists.

Before our organization was formed, one of the most serious complaints of collectors was that no dealer or grower offered annotated material and that the rarer species could seldom be obtained. This is

understandable when we realize the cost in time and money of importing and collecting desirable new plants. Our organization is continually bringing in such species. We have contacts with field collectors, both amateur and professional, in many parts of the world. In less than a year we have advanced considerable funds, for expenses and postage, to various collectors to enable them to search out new introductions that will be available in the future. This entails much correspondence on our part and also a willingness on the part of field collectors to go out of their way to secure material for us. The plants offered by I.S.I. represent only about 10% of the material received by us, as the balance is either dead on arrival or is of little value. This makes plant importation quite costly.

There is also the question of notifying people as to what plants are available, and of listing these plants for all to see. The I.S.I. pays for all listings and offerings in the Cactus and Succulent Journal. This is expensive, and few other sources list their plants to such extent. We feel that these listings in the Journal are necessary, not only to advise which species are available, but also to furnish localities, data and descriptive material for the botanist and collector. This takes much time and research on the part of our members.

In order to offer a continual selection of plants, it is necessary to secure and propagate a relatively few plants of a large number of species. Other suppliers have found it profitable only when a large number of plants of a single species can be propagated and sold over a long period of time. For example, when several hundred, or even several thousand plants of a single species are grown from seed or cuttings, the first one hundred or so plants sold pay for the cost. The subsequent plants when sold represent most of the profit. This is part of the reason why any newly introduced plant, be it a succulent, Rose, Dahlia, or other family, is always higher priced than the commoner ones. As we do not run a commercial nursery and have limited space to grow these plants, we cannot produce large quantities. Then too, many I.S.I. plants are collectors items exclusively and will never be in great demand.

Many of the species offered by the I.S.I. are extremely slow growing. Many must be propagated vegetatively. Therefore, it may take three, four or five years before many of our plants can be offered. We can only do this because our members are not reimbursed for their services in caring for the plants, or for rent, taxes, water and other costs during this period. This is one reason why many other suppliers of succulent plants offer few new introductions but propagate for the most part fast growing, hardy species that take a relatively small amount of care and a short growing time.

The entire income of I.S.I. is received from the sale of plants and plant materials. About 25% of this income goes for packing materials, supplies and postage. Another 25% goes for soil, pots, flats, insecticides and other growing supplies. The remaining 50% goes to collectors in the field for their services, and for transportation costs of new materials. Many times, our members advance funds to the Institute, as donations to field collectors, as often such funds are needed for an immediate collecting trip. Much of the new material coming in will not be ready for distribution for several years. In fact, we are working on plant material that will be ready for distribution several years from now, as the present sources, where we may secure a sufficient quantity of plants ready for immediate distribution, will soon be exhausted.

Besides the plants that we pay for and receive from

field collectors, we have the co-operation of botanical gardens and other institutions, who are permitted to let us have material because we are a non-profit group and will see that the plants are distributed to interested persons. Some of the I.S.I. offerings are from plants introduced by our members, who secured them at considerable personal expense, and while they receive no payment for the plants, they do feel that those who secure these plants should share in the expense of future importations.

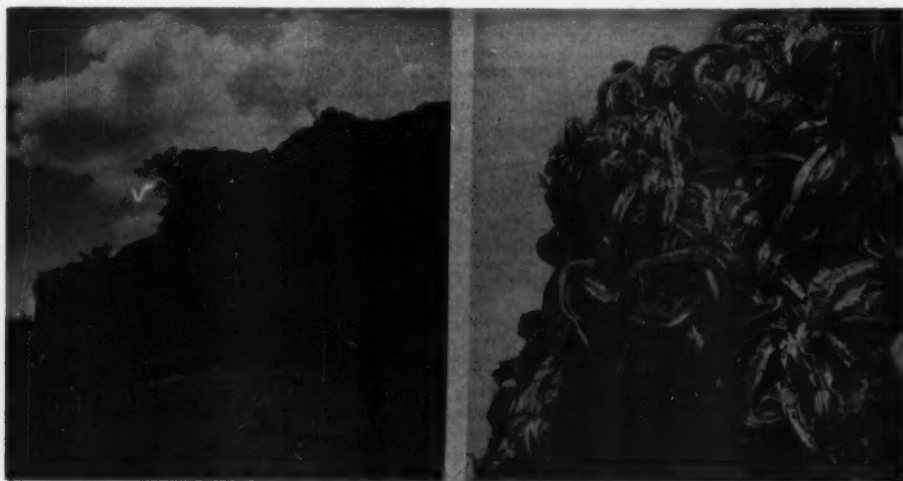
The price of a plant is based on its rarity, cost of handling, difficulty in growing and propagating, and as a measure of the interest that it should have for the collector or grower. The cost in general of all plants can be reduced in direct proportion to the orders that we receive. For example, it costs very little more to ship six or eight plants than to ship two or three. The package and postage charges amount to only a few cents difference. Therefore, each order for a large number of plants leaves more available funds. To those who sincerely appreciate our efforts and the opportunity to secure rare and new introductions, we urge that you take as many plants as you possibly can, even though they may be species in which you have but a small interest. We can assure you that every plant offered costs someone in actual dollars many times what you may secure it for from the I.S.I. Unlike your purchases from commercial sources, the greater part of the income from your orders will be in the nature of a donation that will help to provide funds to enable our organization to secure many valuable species for your future benefit. It is increasingly expensive to collect materials for not only are transportation costs higher, but collectors must go longer distances to collect plants. Many accessible sources have been completely wiped out by hoggish collectors, farming developments, settlements, or even natural causes.

Finally, a word in regard to our reason for placing a price on each plant. We have had suggestions that our offerings be limited to a membership group. Such a membership would probably need to be not less than \$25.00 per year per person, and also be limited as to the number of persons. It has also been suggested that we work on an endowment basis, but we would then be limited to a fixed budget and would find it difficult to distribute plants on a just basis. Again, we might have uses of a nominal sum and allow a person two or three plants per year, or again, we might take orders and propagate only the number of plants ordered, delivering them at some future date. We believe, however, that our way is the best and the most agreeable for all. We can continue only if we have your support. If you wish us to make available these new, valuable or rare plants, support us with your orders, and urge your acquaintances to do likewise. If you are pleased with the I.S.I. plants that you receive, let us know about it. Remember, then, that with your support and with the efforts of each I.S.I. member, this very worthwhile program of ours will be kept stimulated, active and growing.

We thank you for your interest, your past support and for your whole-hearted future support.

J. W. DODSON, *Secretary*  
921 Murchison Dr., Millbrae, Calif.

A few plants are still available from prior lists. Please send self-addressed, stamped envelope for listing.



These sweltering cliffs in central Honduras are the home of *Deamia testudo*. Close-up shows a magnificent colony on a boulder in the Department of Francisco Morazán. Photos by author.

## *Deamia testudo* in Honduras

By CLARENCE K. HORICH

Mercilessly the rays of a tropical sun beat down on a piece of earth named Honduras, in the wild heart of Central America, burning Comayagua's mountain ridges into ragged pinnacles and Choluteca and Nacaome into dust. The sun quenches its thirst with a dozen rivers in Francisco Morazán, Santa Bárbara and Lempira, sending Caribbean-born, hot vapors over steaming jungles and crocodile-infested swamps in ill-famed Olancho and Gracias a Díos, a newly founded department of the disputed area, Mosquitia.

Fascinating, violent Honduras is not exactly a tourist's paradise, if only because of the continual revolts and political coups, or the innumerable six-shooters and other unlikable armory exhibited by most of its male population; but aside from that the republic is virgin territory for anyone in search of new horizons.

Pacific and central Honduras are dry, sparsely inhabited regions. Temperatures exceeding 105°F. are not unusual on the Pacific lowland savannas; the central mountain ranges are sterile, torn wastes covered by dry, seemingly endless pine forests or bleak, desert-like, rock outcroppings. Far north lie the humid Atlantic jungles but these, alas, are far beyond the reach of traffic. The republic's roads are poor at best, only a small section of the highway from Tegucigalpa to Jicaro Galán being partially paved, and the remainder are merely dirt roads.

I have visited Honduras several times, mainly in search of orchids, but found the country's epiphytic flora rather limited, if not disappointing, compared with some of its northern and southern neighbors; however, cacti and other succulents of the semi-desert and savanna vegetation abound in Honduras, spreading south into similar areas of Nicaragua.

Of the many species which I found, but at first ignored, was one which struck my attention time and again: *Deamia testudo*. With its resemblance to a writhing mass of snakes, this species is probably the most conspicuous cactus of Honduras' burning mountain wastes. It is by no means common, but every excursion over the bare, crested hills between Sabanagrande and the Valley of Comayagua reveals the sight of several huge colonies perched on naked boulders and dead tree-trunks.

And what a weird sight they are! Their stems are flattened on the under side and are cuddled tightly to the rock-surface; the joints, which are never longer than ten inches, are formidably armed with long dark spines and creep in all directions, sometimes resembling a migrating family of hedgehogs or, at the next moment, a dangerous Fer-de-lance snake (*Bothrops*). Often widely isolated, a *Deamia* colony will frequently cover an entire 15 ft. high, rock outcropping or pinnacle, occasionally sharing its home with an equally large mass

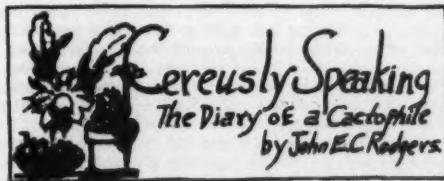


of the lovely xerophytic orchid, *Schomburgkia wendlandii*.

Because the major part of Honduras is made up of naked, eroded mountains and occasional dried, steep river-gorges, *Deamia testudo* is a typical representative of the flora of this country. Flowering in April and May, at the beginning of Honduras' six-month "wet season", our spiny desert outlaw covers itself with enormous white flowers often measuring 30 cm. in length. Soon after, it develops fruits which are sometimes used for beverages by the Hondurans, who call the plant "Tuna" and "Pitahaya".

Ranging from Mexico to Costa Rica, *Deamia testudo* appears to be most frequent on the Pacific slopes throughout its range, despite the fact that it occurs as well in most dry zones of the Atlantic slopes in Honduras, where it is frequently found even in those areas inhabited by an orchid usually restricted to the Atlantic savannas, *Brassavola digbyana*, a xerophytic plant with large white flowers famed by orchid fanciers the world over. Apparently shunning the true lowlands, *Deamia* appears to be confined to altitudes between 300 and 1800 m. (Montana de Jucuára). I have found it in most of the mountains in the departments of Choluteca, Francisco Morazán, Comayagua, Olancho and western El Paraíso, both in blistering hot savannas and in diffuse, well-lit pine forests, commonly associated with *Opuntias* and a small, purple-flowered *Mammillaria*. Large, easily discovered colonies of *Deamia* are found at Km. 15, on the highway from Tegucigalpa to Sabana Grande, near Finca del Ocotalito; other noteworthy areas in which it occurs border the Tegucigalpa-Talanga-Juticalpa road, as in the Majada Verde and near the Laguna de los Patos at Agua Blanca (Talanga).

*Deamia testudo* is a true child of the sun and should be cultivated accordingly. I am sure that cactus collectors will love its strange beauty, so reminiscent of a brilliant sun, desolated mountains, the strike of a rattler, the lazy circling of a lone vulture, and the echoing of horse-hoofs somewhere on the dim horizon; it is an epitome of its wild, tropical home.



As the only eight-time conventioneer of the Cactus and Succulent Society of America, I feel that I should be able to report the convention. My first introduc-

tion to the hospitality of the Henry Shaw Cactus Society was transportation. John Lowler met me at the station and took me to Holiday Inn all of 20 miles from downtown St. Louis. One of the best features of the Inn was the oneness of those present due no doubt, to its being away from the distractions of the city proper. Each one, from the speakers down, was interested in cacti or succulents. The accommodations for both board and room were of the best.

When I arrived there were at least 60 ahead of me and they were sitting around in animated groups of reunion. I heard that Dr. Helia Bravo and Mr. and Mrs. Dudley Gold had arrived from Mexico City. President and Mrs. Johnson were there and many of the old-timers of previous conventions. That living dynamo, Lad Cutak, was everywhere with his usual vigor and efficiency.

I was more than pleased to hear Dr. Frits Went, new Director of the Missouri Botanical Garden who is enthusiastic about our American cacti; most botanical gardens are not sympathetic when it comes to succulent plants. His talk illustrated with colored slides, "Physiology of Desert Annuals," explained many of our long dormant periods for seeds and extended periods of germination. His talk was not only scholarly, it was also understandable to the layman.

Dr. Norman Boke again demonstrated his versatility with, "A Morphologist Looks at Cacti." In Berkeley he proved he was a real cactophile, now I know it. He showed that cacti are intricate in their adaptive parts and each genus shows its true nature when cut into sections of areoles, stem, etc.

"Questions and Answers," a pseudo-roundtable discussion with audience participation proved to us that not all cactophiles are releasing their best ideas to the Journal. The discussion was directed by Harry Johnson, W. Hubert Earle, Ben Haines, and John Rodgers. They brought out the revolutionary idea of baking soaked cactus seeds at high temperatures and treatment of Epiphyllum seeds for good germination.

The Papago Park convention days of 1949 came alive when I saw the colored slides and received the package of material about the Desert Botanical Garden, Tempe, Arizona, by W. Hubert Earle, Director. It is a must for anyone who gets near Phoenix.

George Glade narrated on tape his lecture on "Aloes of South Africa". I think we all wondered at the many species that we do not have in our collections. It was one of the novel types of talks. Lad Cutak, showing slides at the end said, "It's on tape, no questions, please; let George do it."

We were delighted with our first views of English collections when we saw slides of Edgar Lamb's exotic collection of Stapeliads and related genera. Again we saw scores of new plants well grown and at home in English smog.

We, the delegates, met and unanimously selected Mexico City for 1961. Our King and Queen, Mr. and Mrs. Gold, had presided from the first day, expressed their thanks and assured us of a hearty welcome. Chester Moorten showed slides and told us of his adventures in Mexico over a period of years. Evidently we will have a big collecting trip after the Mexico convention and may bring back specimen plants and a new attitude towards Mexico in general.

The members' slides gave that homey flavor which showed each and everyone had a story to tell, a favorite plant to discuss and even an article to write for our Journal. The fun session was a riot.

I certainly hope that I shall see each and everyone of you in Mexico City in 1961. I for one have enjoyed every convention and you may be sure that if it's a cactus convention, you are welcome.

JOHN E. C. RODGERS



# SPINE CHATS

LADISLAV CUTAK



From the letters pouring into my office I gather that the eighth biennial cactus convention was a tremendous success. Of course, we had hoped it would be. Many hours were spent by many people concerned with the convention in various parts of the country in formulating plans for the event. Everything turned out beautiful, including the weather. It was ideal. The management of Holiday Inn Motel turned out to be a wonderful host. All we can say to you who were not present: "You missed a grand time!" Better give thought to the next convention which is scheduled for Mexico City in 1961 and start saving your pennies.

I'm sure there will be many reports given about the St. Louis convention but I'd like to take this opportunity in presenting a few comments of my own. Prior to the convention, Harry Johnson, president of the national society, flew to St. Louis and laid the groundwork for the affair and from then on it was my duty to push it through. Various members of the Henry Shaw Cactus Society were given specific duties and all of them worked hard and diligently at their tasks. Fred Eisele and his daughter, Margaret Delporte, took care of reservations and did a magnificent job. However, we knew Fred was ideally suited for the undertaking as his business training couldn't be matched. Dolores Main filled the role of transportation chairman effectively and got all her people safely and promptly to their destination. Minnie Snyder and Alpha Hoettger spent endless time making table favors and procuring samples as gifts and in their enthusiasm to perform a perfect role forgot to get in on the group picture much to their regret. Anna Frank was delegated to make corsages and table decorations and Lee Stampel was in charge of the sale table. All these people had helpers, of course, as no one could have managed a job singly. These are the unsung 'heroes' without whom success of any venture could not be possible!

My good friend, Father Goellner, started the convention proceedings with an invocation imploring our good Lord to bless our worthy enterprise. Dr. Frits Went, director of the Missouri Botanical Garden, made the address of welcome to which Harry Johnson, president, responded. After that the proceedings were in full swing.

The usual attendance prizes were awarded at the start of each session and consisted of plants and books, generously donated by the California Cactus Growers' Association, the Henry Shaw Cactus Society, and various individuals. John Haag arrived from Tucson with a load of specimen Saguaro and other native cacti, some of which were given out as door prizes but a goodly number were for the collection at Shaw's Garden. Speakers were well chosen, both from an instructive and entertaining standpoint, and we were well supplied with beautiful slides—morning, afternoon and night. The audience must have enjoyed them immensely for the room was never empty at any time. Subject matter was varied and never boring. Dr. Went's subject, "Physiology of Desert Annuals," was highly instructive and the audience was held spellbound by his presentation. Dr. Boke spoke as a "Morphologist Looking at

Cacti" and gave us an insight into the structural growth of the different species. E. F. Anderson went into an extensive discourse on Peyote and Peyotism. Chester Moorten and Dr. Gerald Barad presented travelogues on Mexico and W. Hubert Earle enlightened us on the activities at the Desert Botanical Garden in Phoenix. A taped talk on Aloes by George Glade was given and Brian and Edgar Lamb sent slides and commentary on their Exotic Collection in England. Hector and Sandie Moir sent slides to show how cacti and succulents grow in Hawaii. Every talk was well illustrated by colorful slides.

The coronation took place on the first night and that way everyone got better acquainted with the new king and queen\*. The royal pair then presided over all the sessions. The new king and queen are Dudley and Alicia Gold of Mexico City and they should be of immeasurable help to all those who will be able to make the next convention in 1961. Mexico City is our next convention site. The coronation ceremonies were vested in the able hands of Barad, Cutak and Moorten who did a noble job without any rehearsal beforehand. Dressed in the motel's bedsheets and bedspreads, they looked more like refugees from an Arab camp than serious 'coronators.' One of the nicest things at our conventions is that everyone gets into a festive mood and regardless of age and sex has a grand ball. I'm sure, if the shennanigans were rehearsed you wouldn't enjoy yourself as much.

The fun session is always a highlight of every convention. We sorely missed Patricia Moorten, who wasn't able to be with us, but I'm sure Lad, Jerry and Cactus Slim were a good substitute. You need nuts like them to inject a little fun into the program. As usual, a number of folks were chosen for the initiation and the 'victims' were good sports, as all cactus people are! Jimmy New, Don Podolski, George Stritikus and Ben Haines—the youngest in the crowd—were singled out for one of the stunts and earned their certificate into the "Ancient Order of Cactus Nuts." People didn't believe this could happen at our convention, but one of the initiates was thrown into the pool as punishment for not keeping the thorns of his cactus sharpened. I guess, to add zest to the festivities I was pushed into the pool also and with my shoes on! The dirty conspirators! Everyone roared when I came in dripping from head to foot.

After the initiation proceedings there was a cactus hat contest and a parade of cactus costumes. You should have seen some of the hats! LIFE magazine missed a scoop by not sending out a photographer. One of the Schneckenburger girls wore a dish garden on her head which must have weighed a ton. And the costumes were lovely, too. Kay Beattie took first prize in that category. She had a beautiful white dress with cactus motifs done in black.

Three days of business and fun comprised the convention and the fourth day was devoted to a post convention trip which everyone enjoyed. Bus and cars took the gang to Shaw's Garden to see the special cactus show and other attractions. The cactus show

\*See next Journal for photo.



FIG. 74. The Honorable Mayor, Raymond Tucker, proclaiming week of July 5-11 as "Cactus Week".

took up the entire floor of the large Floral Display House and there were lovely exhibits in beds, patios, gardens and other surroundings, as well as window displays, arrangements, dish gardens and other novelties. Lunch at a nearby Methodist Church preceded the visit to historic Shaw Home and the new headquarters of the National Council of State Garden Clubs. In the evening a performance of "Rio Rita" was taken in, preceded by a box supper on the rehearsal stage and a tour of the mammoth stage. I think the gang thoroughly enjoyed itself in St. Louis and I'm sure you'll be hearing about the 1959 convention for a long time!

#### ST. LOUIS CONVENTION BEST YET

By NICK AND ORVA BOKARICA

As delegates of the Los Angeles Cactus and Succulent Society we wish to report that of the last four conventions, we have attended, the one in St. Louis turned out to be one of the most perfect in every way. The Holiday Inn with its air-conditioning and cuisine kept everyone in the best of spirits in more ways than one. Fred A. Eisele and his wonderful daughter, Mrs. Margaret Delporte together with the able assistance of C. J. Fecht handled the registration in perfection.

The program did not follow the printed form but its informality and the excellent speakers pleased everyone. Lad's illustrated lecture, "See Missouri Attractions and Cacti for Home and Garden" was very enjoyable. We showed 100 slides of new *Epiphyllum* hybrids from Sherman Beahm Gardens of Pasadena, California.

The after-session sessions followed the three evening meetings and we know now why our group was housed in the rear of this large motel. John Rodgers of Lorain, Ohio, Cactus Slim Moorten of Palm Springs, California, Dr. Gerald Barad of Ringoes, New Jersey, and ourselves kept up lively discussions until the wee hours of the morning.

The fellowship and good natured fun is an important part of any convention and these many pleasant memories will remain with us for life. Thank you a million times.

#### OREGON CACTUS SOCIETY

Oregon Cactus Society president Don Cluster started out the January meeting by declaring a "State of the Union" message and laying out plans to make 1959 the best year ever for our club. As this is Oregon's Centennial Celebration, it was decided that the Society should participate in as many shows as possible, and bring our plants to the attention of Centennial visitors as well as to the native Oregonians, many of whom are not aware that Oregon and Washington both have native cacti.

The Society set up a display at the Parade of Gardens in Gresham, Oregon, April 16-19, and received a purple ribbon merit of distinction. No cash prizes were awarded at this show, but all garden clubs participating were allowed to have a plant sale, which we found very profitable. The most popular plants sold were native Oregon and Washington plants collected on field trips the previous year by members.

During the Rose Festival Week held in Portland June 7-12, our Society arranged a display at the Park Blocks in downtown Portland, which attracted very favorable interest and attention. A plant sale was allowed during the last hour of the Festival only, but attendance was very small at this time, and few plants were sold.

Our annual picnic was held at Champoeg State Park on July 19, where a display of native Oregon cacti was planted in July, 1959 by members. Additional plants were added to the display, which is about 8 feet in diameter and has a wooden rustic sign built by Mr. Cluster. Plants were donated by Mrs. Mary Farver, and her generosity was greatly appreciated. The members also voted to keep a scrapbook of club activities and all were urged to dig out old pictures, press notices and other items of interest.

The August meeting will cover planning for the Society display at the Oregon State Fair in September.

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12 Oz. package I.S.I. Minerals I-B and sample of sand, for growing cacti, other succulents, and most house plants, prepaid ..... \$1.40

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**BEN M. HAINES**

1902 Lane — Topeka, Kansas



